CDS G3

User's Manual

For Version 1.5 Software

MERCURY

Table of Contents

Contents

What is CDS G3? 1

CDS G3 Support 1

Installation 1

Computer Requirements 1

PC Minimum Hardware Specifications 1

Operating System Requirements 2

Licensing and Registration 2

Licensing 2

Registration 2

Hardware 4

SmartCraft Interface Cable 5

G3 Harness Connections 6

Vessels with a Junction Box 6

Vessels without a Junction Box 6

Version Format 8

CDS G3 Updates 9

New Features Introduced in CDS G3 1.5.0 9

Printing 9

Live Data – Categories and Drag and Drop Sorting 10

Becoming Familiar with the CDS G3 program 11

Home Screen 11

Registration Screen – CDS G3 11

CAN Traffic 11

Module Data Screen 12

eBOM Screen 12

Configuration 13

Helm Configuration 13

Helm Setup 14

CAN Pad Configuration 15

Autopilot Configuration - 17

Drive Configuration 18

Compass Configuration 19

Personality –.....22
Diagnostics -.....22
Set Trim Limit.....23
Set Tilt Limit.....23
Set Engine Location.....23
Set Tach Link.....24
Cylinder Misfire.....24
Fuel Pump Output.....24
Idle Air Control.....25
Horn Output.....25
Ignition Spark.....25
Smart Start.....26
Tach Output.....26
Steering Override.....26
Injector Pulse.....27
Auto Test.....27
Reflash Package Browser.....28
Reflash Prerequisites.....28
Reflash Module View.....28
Reflash - Serial Number/Hull ID.....29
Reflash Cautions.....29
Reflash Progress.....29
Reflash Event History.....30
Show Options.....30
Units.....31
Connections.....31
Language.....31
Help Screen.....32
Other Training Opportunities.....32
FAQ's.....32
Appendix.....33
SmartCraft Interface Driver Installation.....33
Error Codes.....33
Registration Errors.....34

What is CDS G3?

CDS G3 is a standalone PC based program that complements the original Mercury Computer Diagnostic System (CDS) by providing diagnostic support for select engines and Mercury Joystick Piloting systems. Additionally, all configuration functions necessary for preparing these systems for delivery are also supported. CDS G3 allows for CAN based multiple processor communication through a clean, easy to navigate interface.

CDS G3 Support

Mercury Marine will provide support for the CDS G3 program and hardware. Any issues determined to be outside of the CDS G3 program or hardware will be the responsibility of the user. For support with CDS G3, contact Mercury Marine Technical service at 920-929-5884.

Installation

Any installation disc for CDS G3 may be installed without a previous version of the software. Before proceeding with installation, complete all "High Priority Updates" as provided by Microsoft through Windows Update. If updating CDS G3 from version 1.0, uninstall the software prior to installation of a current version. If updating from CDS G3 version 1.1 or later, un-installation is not required.

To install CDS G3, insert the installation disc into the disc drive of the computer. If the software installation does not start automatically, navigate to your optical drive and run "setup.exe". This will most commonly be "D:\setup.exe". During installation, the following programs will be installed:

- Microsoft ReportViewer 2010
- Microsoft Visual C++ 2010 SP1 Redistributable Package (x86)
- Microsoft .NET Framework 4.0 Client
- Windows Installer 4.5
- Kvaser 4.9 CAN Adapter Driver

These additional programs are required for CDS G3 to deliver a rich, interactive user experience.

Administrative rights – The user performing the CDS G3 program installation must have administrative rights. If the computer has a MCDS user account, that user account was given administrative rights when it was created by an earlier CDS installation.

NOTE: Some information technology (IT) departments may restrict user rights for these accounts. If this has occurred, either the IT department must perform the installation, or they must grant administrative rights to the user accounts performing the installation.

Computer Requirements

* Minimum specifications are established to support both CDS and CDS G3.

PC <u>Minimum</u> Hardware Specifications

- 1.2 GHz Pentium Processor
- 2 GB RAM
- 120 GB Hard Drive
- 802.11 b/g/n Wireless OR 10/100 Ethernet

- DVD ROM Optical Drive
- USB 2.0 port (qty. 3) to accommodate CDS USB components**
- Optional 9‑pin serial port***

*** A single USB port plus a USB port hub may be used.*

**** The serial port is no longer required, but is still preferred. The use for a serial port is for CDS only.*

Operating System Requirements
Windows 7 Professional or Windows 8 Professional

Licensing and Registration

Licensing

For each copy of CDS G3 (kit or upgrade disc) purchased, a license will be issued to the dealer account number making the purchase. This license is limited to one per computer. If you desire to use CDS G3 on more than one computer, you will need an additional license for each computer. In this case we recommend a second kit because the hardware included in the kit is required for full functionality. When considering a second kit, keep in mind that to update minor revisions (example 1.4 to 1.5), you will need to purchase an update disc (license) for each installation.

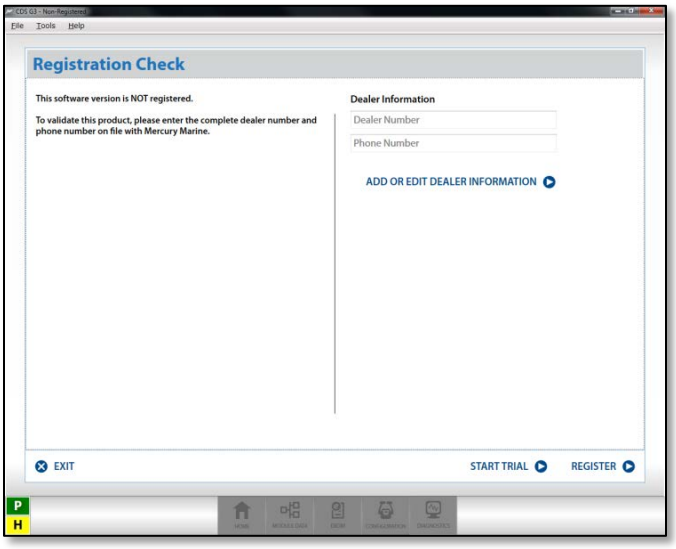
CDS G3 licensing is not transferable between dealer numbers. We do recognize and respect the need to transfer your CDS G3 license between PC's within your business for issues such as hardware failure, or computer upgrades. If such an issue should arise, please contact the Mercury Marine Service department to submit this request. We will only allow transfer of the current version of software. If you are using a previous version, please purchase the current version and install on the new PC.

The CDS G3 licensing agreement is presented for review and acceptance during installation. This document can also be accessed after installation in the Start Menu. The location is: Start → Mercury Marine → End User License Agreement. We recommend reviewing this document for further details.

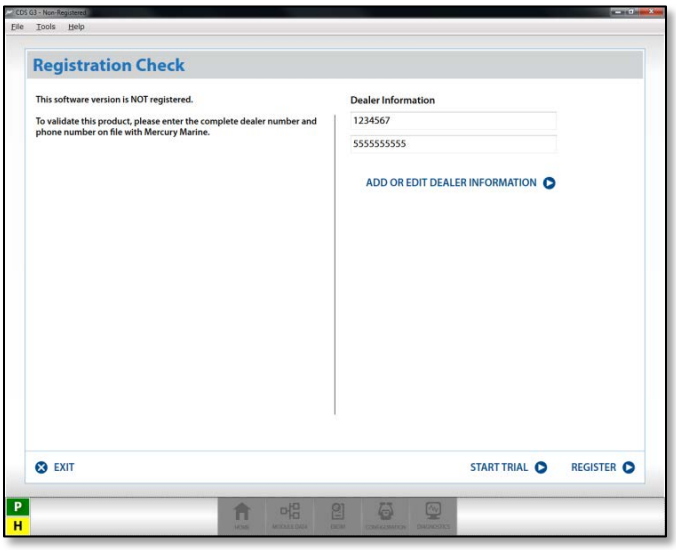
Registration

Two options are available when registering CDS G3 software; they are a 15 day trial or register. The trial mode will provide all functionality except the ability to reflash. When the trial expires, the software is disabled until registration is completed. When CDS G3 is registered, validation will be required every 45 days. To register and validate, internet access is required. Software registration may be re-validated at any time to restart the 45 day validation clock. Once 45 day window has expired, the software will be disabled until validation is completed.

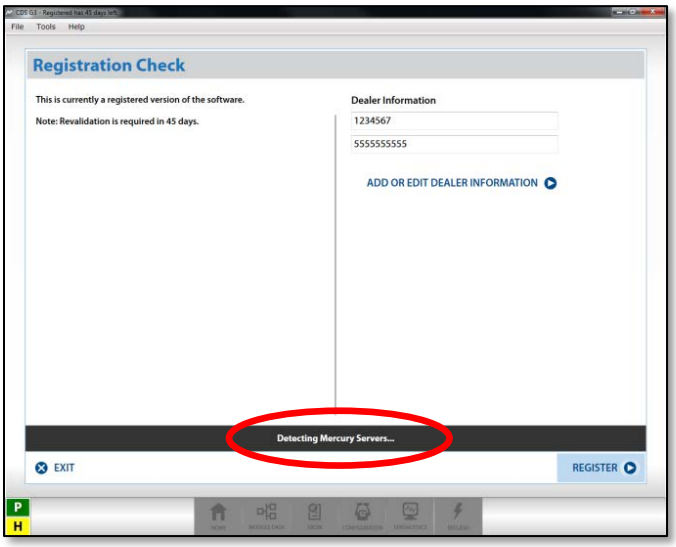
When the CDS G3 software is first started, you will be taken to the registration screen and prompted for your Dealer Number and Phone Number:

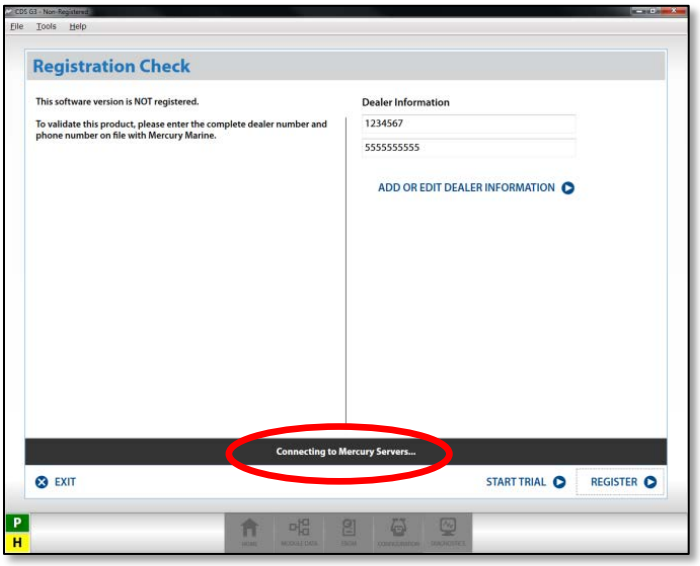


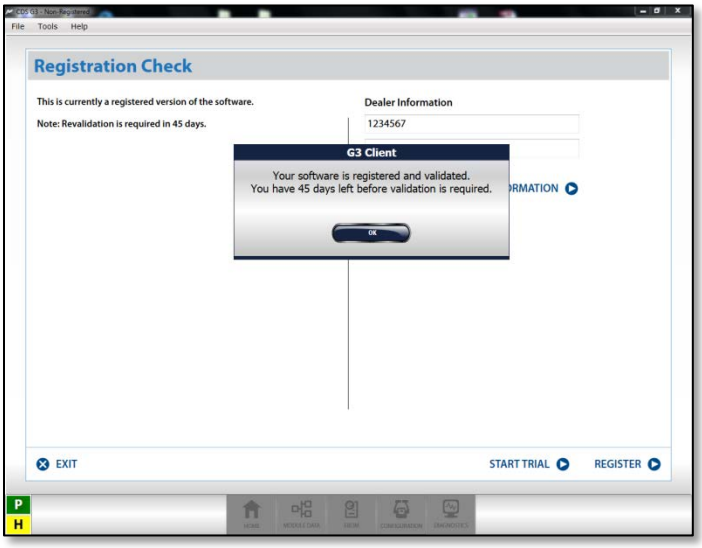
Enter your Dealer Number and Phone Number. The phone number to be used will be the main phone number on record with Mercury Marine. Please enter this information with just numbers and no other characters as shown in the illustration to the right.



Once you click on “Register” you will see the following screens:







Hardware

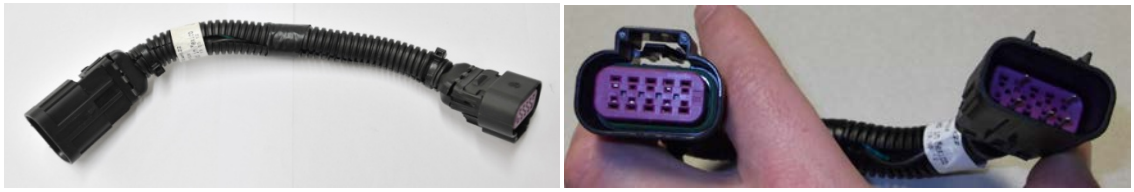
CDS G3 requires the following hardware:

- **898289T81** – SmartCraft Interface Cable (USB to DB9) (Contains 879365022)

- **898289T83** – Can P & H Adaptor (DB9 to 10-Pin CAN) (Contains 8M0044023)

This harness functions only as an adaptor between a DB9 and SmartCraft CAN Connector

- **8M0046081** – Harness Adaptor w/ Resistors (10 Pin CAN to 10 Pin CAN)



Required to replace a termination resistor when one is removed to gain access to the CAN bus

All of the components above are sold within the CDS G3 kit, part number 8M0087444. This kit will also include a disc containing the current version of the CDS G3 software at the time of purchase.

When interfacing your CDS G3 diagnostic tool to the CAN bus, proper termination must be maintained. If you are gaining access to the CAN bus by removing a termination resistor, you must use the 8M0046081 adaptor harness. If you are accessing the CAN bus through an open j-box port, 8M0046081 will not be used. More details on proper connection are detailed later in the section, "G3 Harness Connections".

SmartCraft Interface Cable

The SmartCraft Interface cable is a diagnostic interface to provide the ability for CDS G3 to communicate on Mercury CAN bus networks. Some features of the SmartCraft interface cable are:

- Ruggedized
- 2 channel (CAN P/H)
- USB to DB9 Interface
- Powered from the PC, not the engine

The SmartCraft interface cable has 3 LED lights; one green power LED and two orange CAN bus LEDs. The power LED will illuminate solid green to indicate it is functioning correctly. This LED will flash if it has an issue. If this is encountered, most likely the device driver is not installed properly. Corrective action for this condition is documented in the Appendix. When the SmartCraft Interface is properly connected to both an engine and the diagnostic computer, you should have a solid orange LED on the appropriate BUS indicator on the interface (BUS 1 and/or BUS 2). This LED will flicker with communication. Any non-communicating BUS channels will be indicated with an occasional illumination of the associated orange LED. Similarly, the CAN P/CAN H button in the CDS G3 software would be red or yellow to indicate no communication and green to indicate communication.

G3 Harness Connections

Vessels with a Junction Box

1. Insert the SmartCraft Diagnostic Interface USB connector into a powered USB port.

2. Connect the SmartCraft Diagnostic Interface DB9 connector to the CAN P/CAN H adapter harness DB9 connector

3. Connect the CAN P/CAN H adapter harness to the junction box to communicate with the power package.

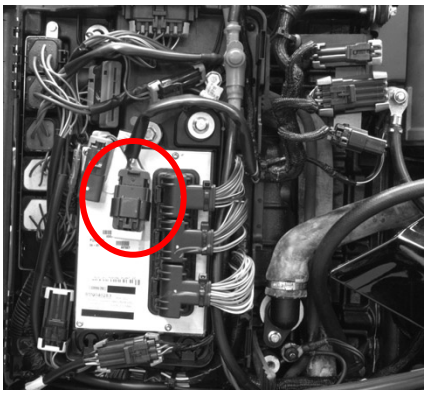
IMPORTANT: Ensure the correct termination resistor is installed on the CAN P bus. The CAN P bus must be properly terminated for the tool to communicate reliably. Improper termination will result in communication errors or complete loss of communication.

Vessels without a Junction Box

Follow Steps 1 and 2 from the previous instructions for Vessels with a Junction Box.

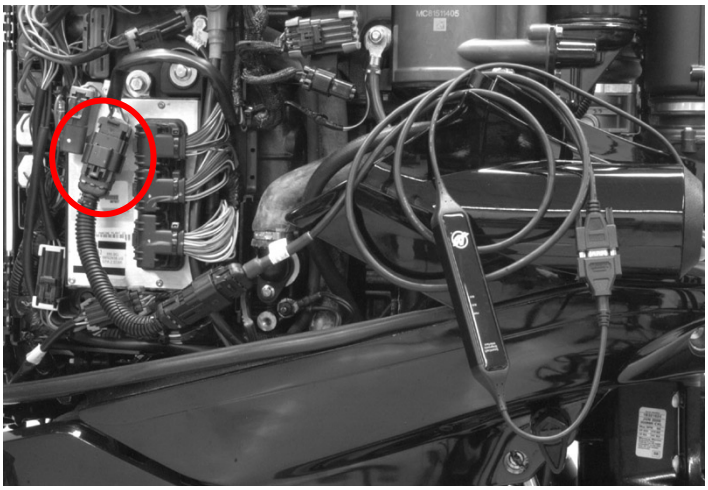
3. Remove the CAN P termination resistor from the engine harness.

NOTE: The following graphics show the Verado 350 SCi CAN P termination resistor location. Refer to the appropriate service manual for the location of the CAN P termination resistor for all other power packages.



Connect the CDS G3 harness adapter (84‑8M0046081) to the CAN P/CAN H adapter harness, and connect the adaptor harness to the engine harness connector.

IMPORTANT: *The CDS G3 harness adapter (84‑8M0046081) contains the correct termination resistor for the SmartCraft Diagnostic Interface to communicate with the control module.*

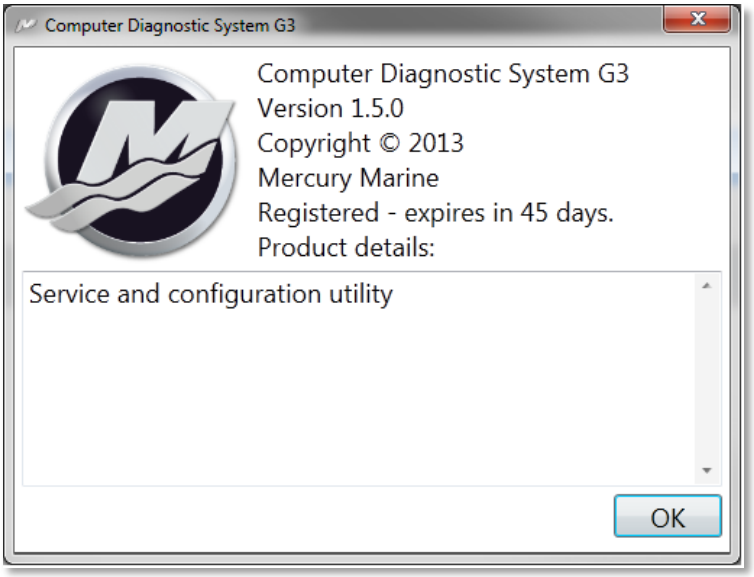


Version Format

CDS G3 versions are defined by a version number. The example below shows version 1.5.0. The version number will define 3 parts of the version: a major version, a minor version, and a build number. The image below is from the CDS G3 startup "splash screen", along with a description of the version number.

"1" – Major Version Number
"5" – Minor Version Number
"0" – Build Release Number

The complete version number can be noted from the splash screen, like above, or by selecting Help/About from the upper menu. You will then see the screen below.



The major version number will designate very drastic changes to the software. We currently have not changed this number since the introduction of the CDS G3 software.

The minor version number designates considerable changes in the software, usually requiring us to issue a new installation disc. Typically this update will introduce new functionality and address major bugs. Minor versions are also where we issue licensing. Each minor version is licensed separately. If you have purchased a copy of 1.5, you are licensed for this and all builds within 1.5. This holds true for all minor versions.

The build version number designates small changes in the software. Typically we provide new eBOM's, minor bug fixes, and provide slight product improvements. These updates are acquired within the CDS G3 program and are included with your minor version. What this means is when you purchase version 1.5, you are entitled to all updates from 1.5.0 (the version installed from the 1.5 installation disc) through the current, latest version.

CDS G3 Updates

CDS G3 updates are provided in two ways, one for the minor versions, and one for the build. To acquire the minor version of our software, you will purchase either a CDS G3 kit (includes current software), or an upgrade disc. The installation disc is a full installation so previous versions are not required. Also if you have a previous version installed, you can install an update without uninstalling the previous version. Once installed and registered, you can apply build updates available to your version to reach the most current version.

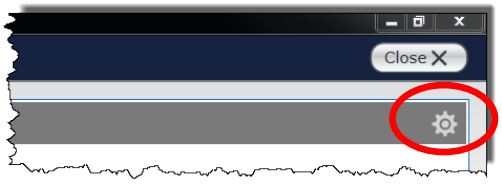
Build updates are downloaded from within the CDS G3 software. As long as the computer has internet access when the CDS G3 software is started, it will automatically check for available updates. If updates are available, you will be notified on the Home Screen. The update process can also be manually initiated by selecting "Tools" and "G3 Updates" from the upper menu.

IMPORTANT: *Updates will require both administrator rights on the PC and an internet connection. The internet connection is required to download build updates and to register.*

New Features Introduced in CDS G3 1.5.0

Printing

New in CDS G3 version 1.5 is the ability to print data from Freeze Frame, Faults, and Run History. This feature provides the ability to create a clean, professional document in printed form, or a PDF document. Each of these screens will have a gear icon in the upper right corner to access the Print Page feature. This icon will not be available from View Faults or Freeze Frame if faults or freeze frame data are not present.

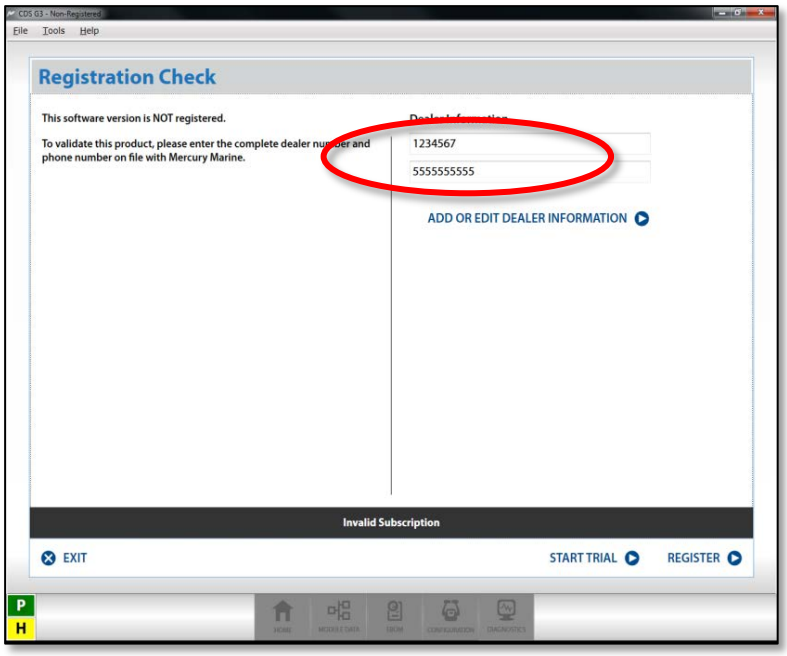


Gear Icon to access Print Preview

Another new print feature is creating a full report. A full report will create a summary view, and include Freeze Frame, Faults, and Run History, along with the ability to include your full dealership information and your customer's information. A full report can be created by selecting File →Print Full Report, or pressing F12. Inside of the preview of a full report, a gear icon will be available to include or exclude dealer and customer information.

The customer's information can be added directly in this menu when "Add Customer Information" is selected. This information will be available until the CDS G3 program is closed; it will then be removed. You may change this information at any time without closing the software by selecting the gear icon, Remove Customer Information, and again select the gear icon and Add Customer Information. The Add Customer Information window will open and allow you to change the content.

Dealer information is entered by completing “Add or Edit Dealer Information” as part of Registration. To enter or edit your dealer information, select Tools → Registration. If entered, your dealer information will be displayed here. Your dealer information will remain in the program, unless it is manually removed through the “Add or Edit Dealer Information”.

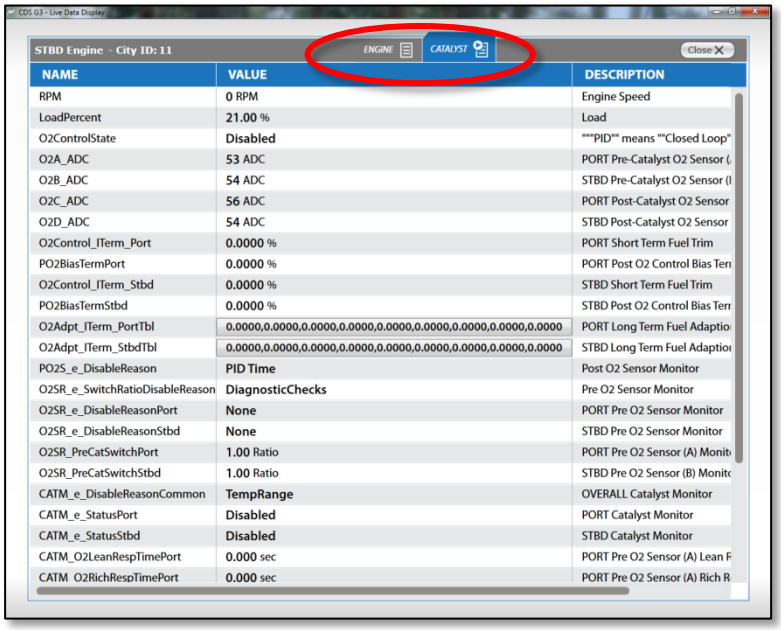


With the inclusion of these new print features, the Print Screen button in the main tool bar has been removed. You can still use the old print screen function by either selecting File → Print Screen, or pressing Ctrl+F12 to capture the current screen.

Live Data – Categories and Drag and Drop Sorting

The live data screen has undergone considerable changes intended to improve readability and ease of use. Along with improvements to the layout, all data items may be reordered by simply dragging and dropping the item in the desired location. This will allow the user to bring focus to items of concern within the same view without having to scroll to view data items.

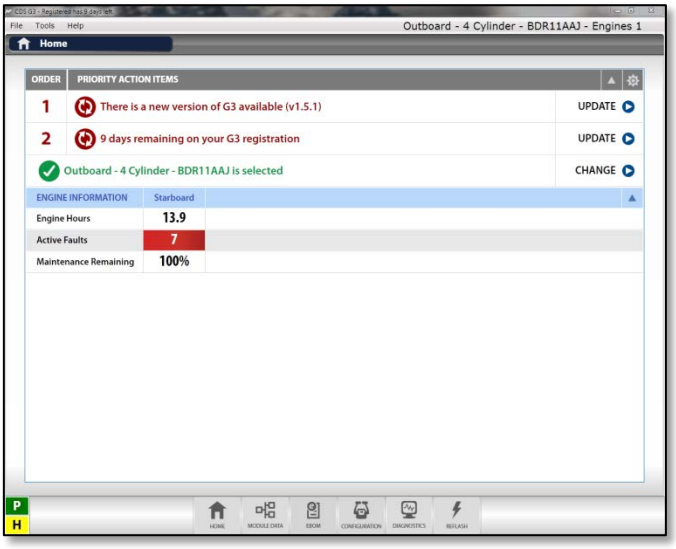
While working with some systems, the live data screen may now show 2 tabs. These tabs are categorized data list items. The example to the right, displays the categories of Engine and Catalyst. Data items specific to catalyst have been located in this category. When diagnosing a catalyst related issue, selecting the catalyst category will provide you with quick access to this data without having to filter through the full data list.



Becoming Familiar with the CDS G3 program

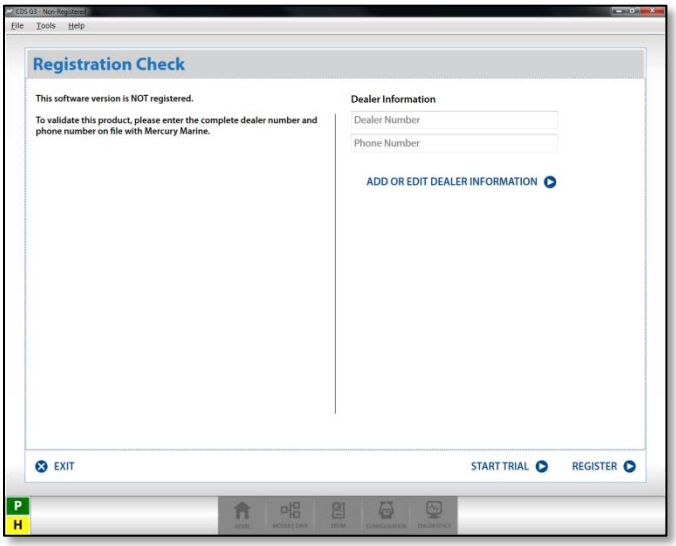
Home Screen

The Home Screen will report important information including issues requiring attention. In the screen capture to the right, we are notified of a new software update, 9 days are remaining on your G3 registration, and an eBOM is selected. These issues should all be addressed for CDS G3 to function properly.



Registration Screen - CDS G3

Registration will be presented on any CDS G3 installation that has not completed the process. This screen is also accessible by selecting Tools → Registration. To register, an internet connection is required. Your full dealer number and full phone number are also required. Registration is required every 45 days, but can be performed at any time. Once completed, the 45 day registration timeframe is reset.



CAN Traffic

The CAN button will let you know the communication status on CAN P and CAN H.

Red - The computer is not connected to the SmartCraft Diagnostic Interface cable

Yellow - The computer is communicating with the cable but no data is being received on the CAN bus.

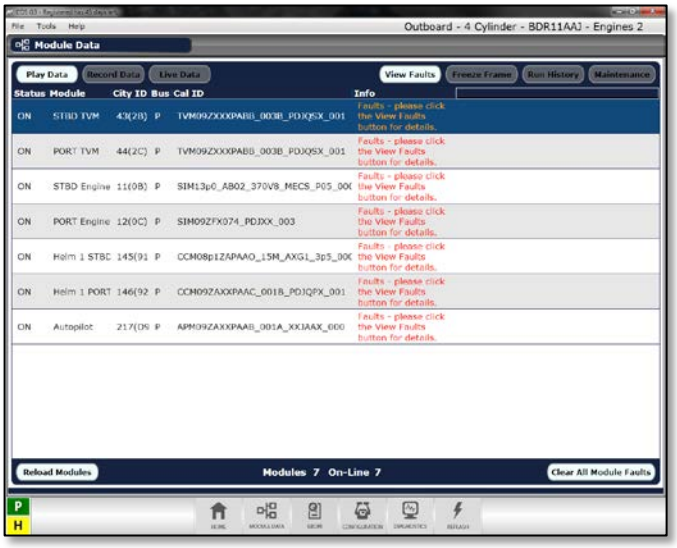
Green - The computer is communicating on the CAN bus.

NOTE: CAN H will only turn green for models using CAN H. (Example: Outboard Joystick Piloting and Axius products)

Module Data Screen

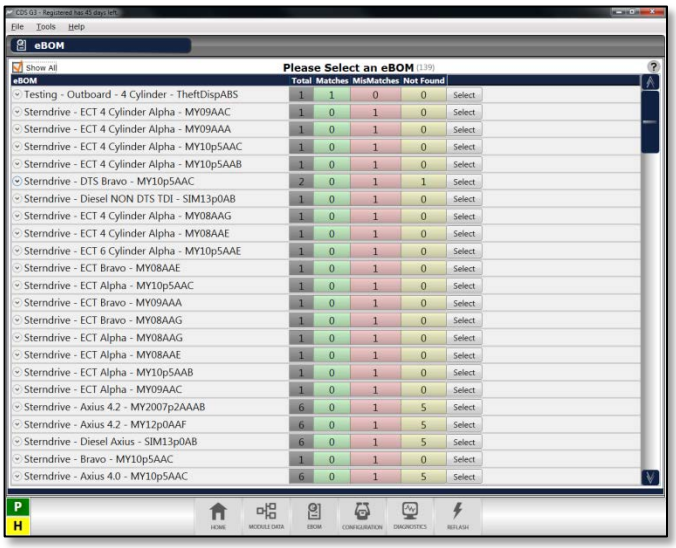
The Module Data screen allows the user to view data and engine faults. The selections in Module Data include:

a. **Play Data:** Allows the user to open a recorded file (.bdr) from a previously recorded session and play back the data in raw format.
b. **Record Data:** Allows the user to choose data items and record them to a file (.bdr)
NOTE: Only numerical items may be recorded at this time; this may not represent all of the items available via live data.
c. **Live Data:** Provides access to the data items for all modules.
d. **View Faults:** This button is only available if faults are found on the engine. The red text in the info column states the engine has faults.
e. **Freeze Frame:** Provides access to memory buffers within the ECM. Freeze Frame buffers contain snapshots of data items at the time a fault occurs.
f. **Run History:** Provides access to a runtime history map. Each time value is assigned to an RPM band. The RPM bands can be cleared but the total engine runtime will stay the same.
g. **Maintenance:** Displays the current maintenance value, and provides access to resetting the maintenance percentage to 100%.
h. **Reload Modules:** Clears all modules in module data and restarts module discovery.
i. **Clear All Module Faults:** Clears all faults present and rescans for faults.

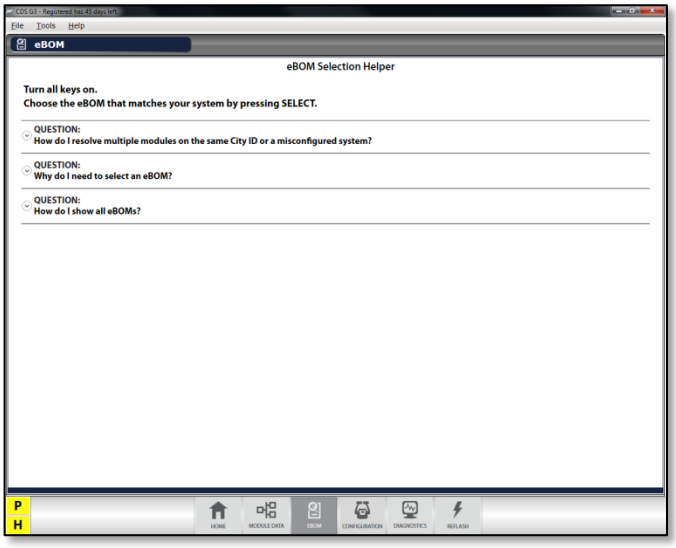


eBOM Screen

eBOM stands for "Electronic Bill of Materials" and displays the possible matches to the system the tool is connected to. CDS G3 has the ability to actually talk to each ECM/PCM that is connected in the boat via CAN P. It will report what ECM/PCM it has found by showing a "match" next to those particular eBOM's. Some boats can have multiple ECM/PCM's depending on the SmartCraft configuration and the number of engines.

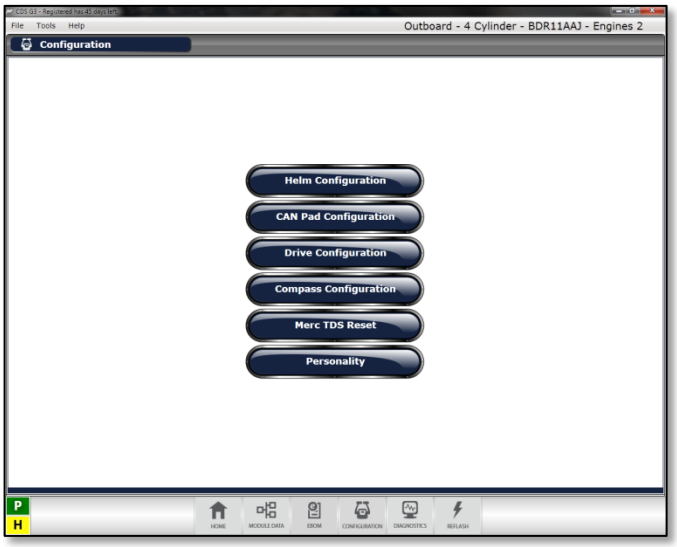

eBOM
Please Select an eBOM
Show All
eBOM
Total
Matches
MisMatches
Not Found
Testing - Outboard - 4 Cylinder - TheftDispABS
Sterndrive - ECT 4 Cylinder Alpha - MY09AAC
Sterndrive - ECT 4 Cylinder Alpha - MY09AAA
Sterndrive - ECT 4 Cylinder Alpha - MY10p5AAC
Sterndrive - ECT 4 Cylinder Alpha - MY10p5AAB
Sterndrive - DTS Bravo - MY10p5AAC
Sterndrive - Diesel NON DTS TDI - SIM13p0AB
Sterndrive - ECT 4 Cylinder Alpha - MY08AAG
Sterndrive - ECT 4 Cylinder Alpha - MY08AAE
Sterndrive - ECT 6 Cylinder Alpha - MY10p5AAE
Sterndrive - ECT Bravo - MY08AAE
Sterndrive - ECT Alpha - MY10p5AAC
Sterndrive - ECT Bravo - MY09AAA
Sterndrive - ECT Bravo - MY08AAG
Sterndrive - ECT Alpha - MY08AAG
Sterndrive - ECT Alpha - MY08AAE
Sterndrive - ECT Alpha - MY10p5AAB
Sterndrive - ECT Alpha - MY09AAC
Sterndrive - Axius 4.2 - MY2007p2AAAB
Sterndrive - Axius 4.2 - MY12p0AAF
Sterndrive - Diesel Axius - SIM13p0AB
Sterndrive - Bravo - MY10p5AAC
Sterndrive - Axius 4.0 - MY10p5AAC

EBOM Selection Helper - The eBOM Selection Helper has been implemented to assist the user when CDS G3 cannot resolve the selection of an eBOM

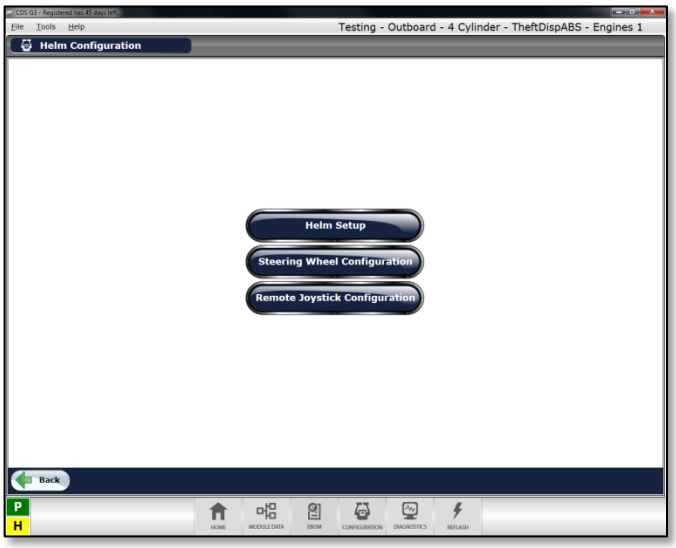

File Tools Help
eBOM
eBOM Selection Helper
Turn all keys on.
Choose the eBOM that matches your system by pressing SELECT.
QUESTION:
How do I resolve multiple modules on the same City ID or a misconfigured system?
QUESTION:
Why do I need to select an eBOM?
QUESTION:
How do I show all eBOMs?
P
H

Configuration

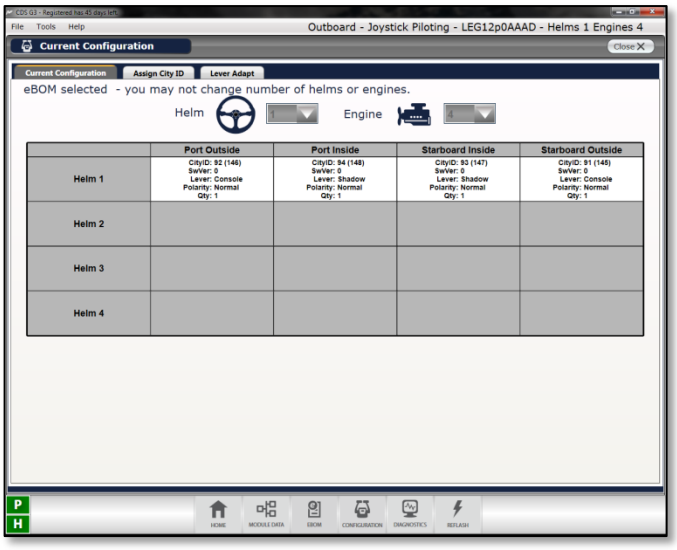
Configuration allows the user to access the helm related configuration items, such as steering wheel, handles, and CAN pads.



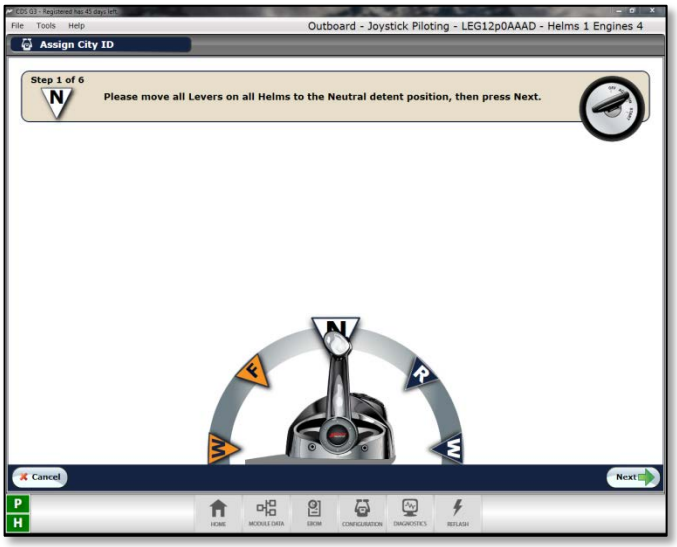
Helm Configuration - Helm Configuration provides access to helm status and configuration tools required for the setup or repair of a DTS system. The items within this section are as follows:



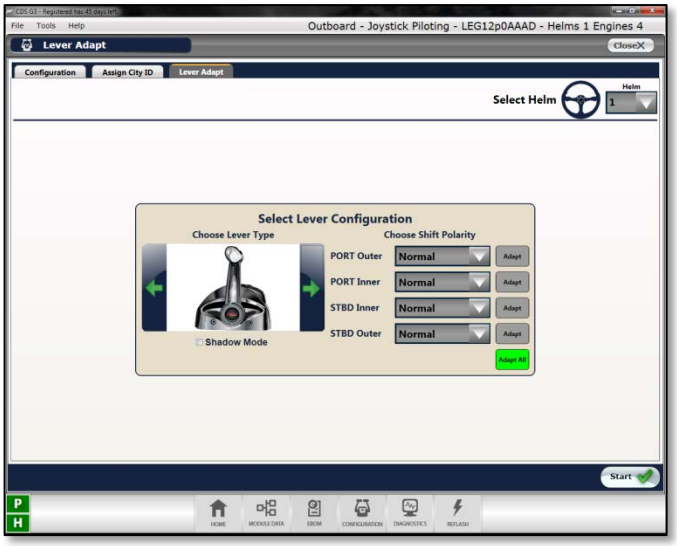
Helm Setup - Helm Setup allows the user to configure a helm to make the control system fully operational. By following the helm setup wizard, the module ID is set as part of the process.



Current Configuration – This tab displays the current helm configuration status of the vessel. The information is presented in a matrix format that is configured in a manner which displays information relative to the back of a boat. Example: starboard on the right and port on the left. Some of the information provided in a matrix is the module's city ID, software version and quantity of modules at that address.

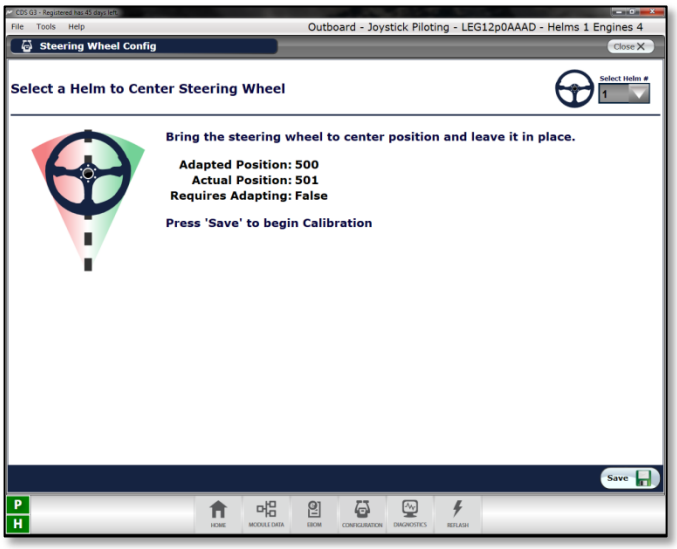

Outboard - Joystick Piloting - LEG12p0AAAD - Helms 1 Engines 4
Assign City ID
Step 1 of 6
Please move all Levers on all Helms to the Neutral detent position, then press Next.
Cancel
Next

Assign City ID – This tab allows the user to set the City ID's for each helm module. This is exercised by moving a handle that coincides with a module. By following this wizard, the module's City ID is set.

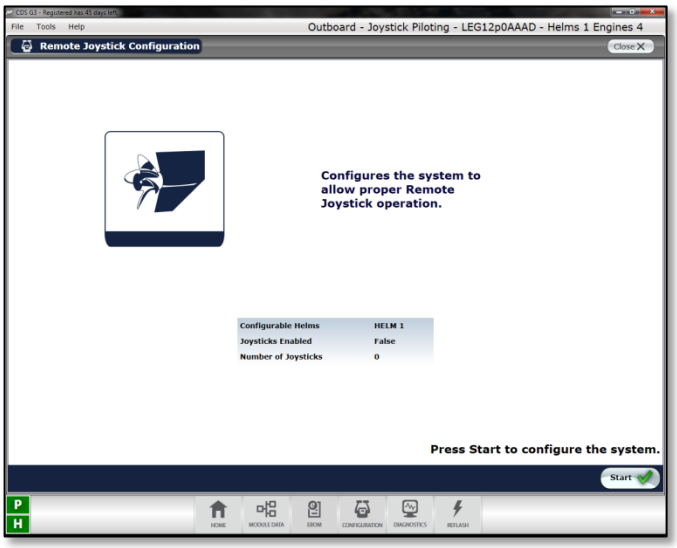


Lever Adapt – This tab allows the user to configure the lever through its range of operation so that the module can learn the positions of forward, neutral, reverse and all detents.

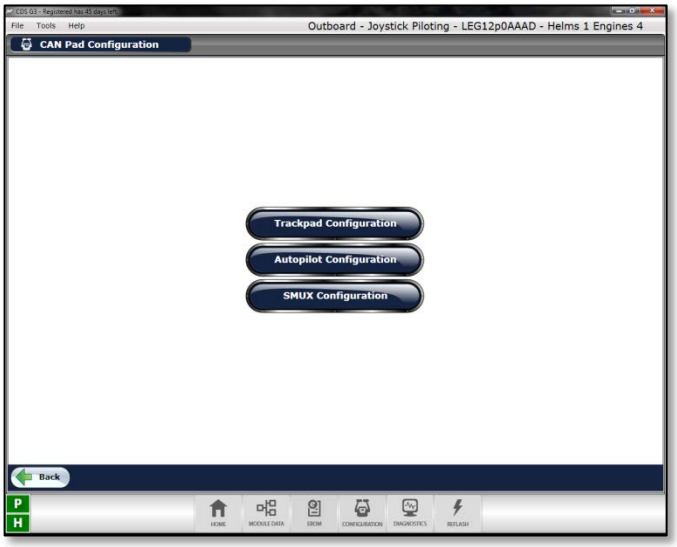
Steering Wheel Config – This feature provides access to a tool that allows the user to set the center location of the steering wheel. The tool must see movement of the steering wheel for the value to be set. For example, if the steering wheel is already in the center position, move it left or right and back to center to set the value.



Remote Joystick Configuration - The Remote Joystick Configuration button provides access to a tool that allows the user to define the number of remote joysticks available on each helm. The number of helms will be displayed followed by the number of remote joysticks the helm can use and the number of joysticks that are enabled for the helm. This does not indicate a total number of joysticks on the vessel, but rather the number of joysticks accessible by each individual helm.



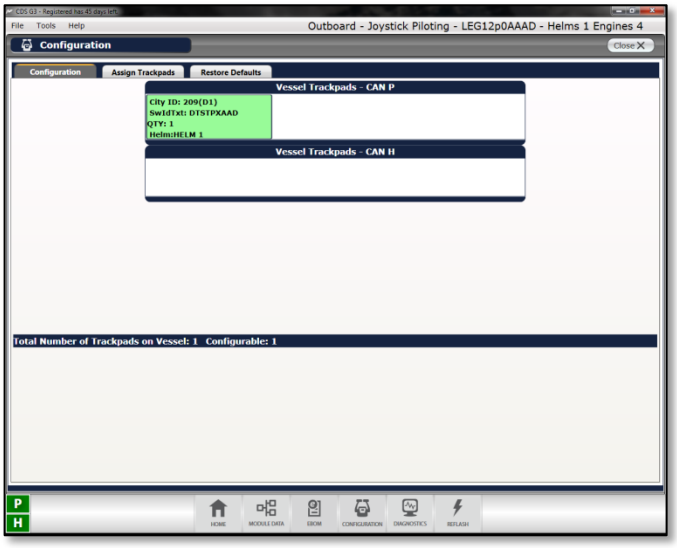
CAN Pad Configuration - CAN Pad Configuration provides access to Trackpad, Autopilot, and SMUX status and configuration tools required for setup or relocation within a SmartCraft system. The items within this section are as follows:



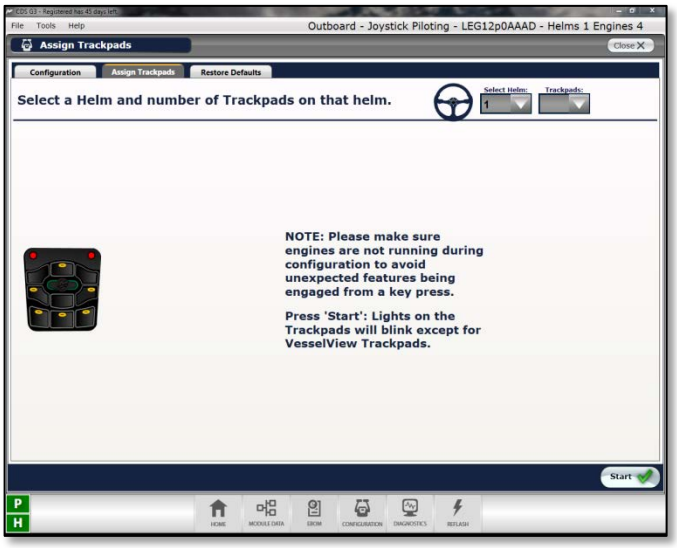
Trackpad Configuration – This feature allows the user to view and configure the Trackpad on each helm.

Trackpad Configuration displays the current Trackpad Configuration status of all helms, as well as information related to each Trackpad. Trackpads that show in the grid with a black background are not configurable. If there is more than one Trackpad at a single address, the Trackpad in conflict will need to be reassigned to a new address. To identify a Trackpad at a specific location with one in the grid, press a button on that Trackpad and a cell in the grid will flash indicating its location.

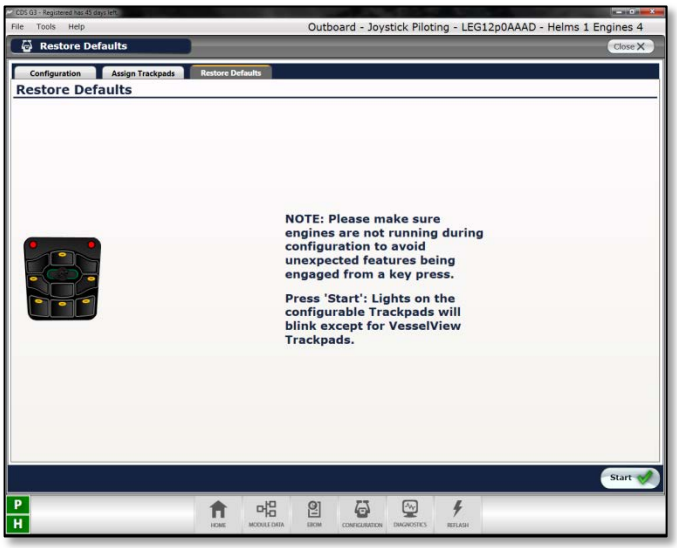
NOTE: To prevent potential conflicts with another module, this tool will not assign a Trackpad to the address of D9.



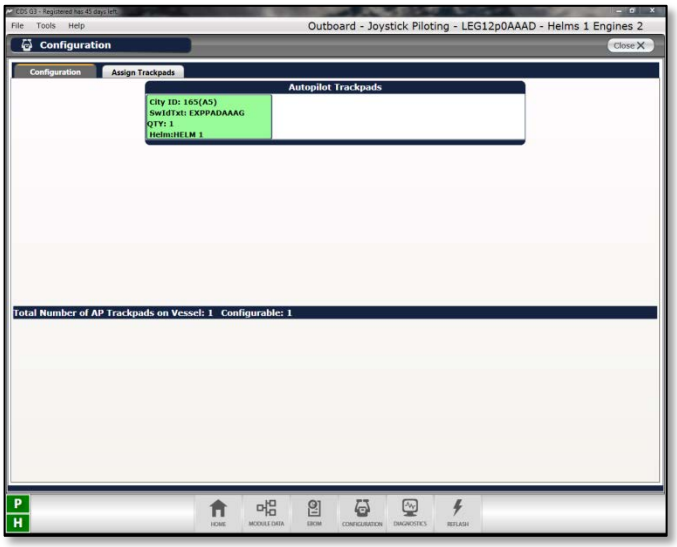
Assign Trackpad – This feature provides the user a wizard for assigning Trackpad addresses by helm. All configurable Trackpads on a helm will flash with the exception of the VesselView pad. The VesselView pad does not have lights.


Outboard - Joystick Piloting - LEG12p0AAAD - Helms 1 Engines 4
Assign Trackpads
Configuration
Assign Trackpads
Restore Defaults
Select a Helm and number of Trackpads on that helm.
Select Helm:
Trackpads:
NOTE: Please make sure engines are not running during configuration to avoid unexpected features being engaged from a key press.
Press 'Start': Lights on the Trackpads will blink except for VesselView Trackpads.
Start

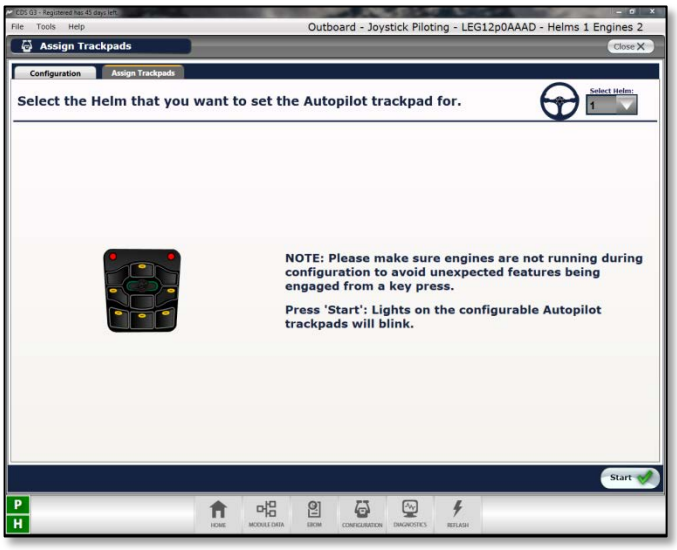
Restore Defaults – This feature gives the option to assign all Trackpads to their original City ID


Outboard - Joystick Piloting - LEG12p0AAAD - Helms 1 Engines 4
Restore Defaults
Configuration
Assign Trackpads
Restore Defaults
Restore Defaults
NOTE: Please make sure engines are not running during configuration to avoid unexpected features being engaged from a key press.
Press 'Start': Lights on the configurable Trackpads will blink except for VesselView Trackpads.
Start

Autopilot Configuration - Autopilot Configuration allows the user to view and configure the Autopilot Pads on each helm.



Configuration – This displays the current Autopilot Pad configuration status of all helms, as well as information related to each autopilot. Autopilot Pads that show in the grid with a black background are not configurable. If there is more than one autopilot at a single address, the autopilots in conflict will need to be reassigned to a new address. To identify an autopilot at a specific location with one in the grid, press a button on that autopilot and a cell in the grid will flash indicating its location.


Outboard - Joystick Piloting - LEG12p0AAAD - Helms 1 Engines 2
Assign Trackpads
Configuration
Assign Trackpads
Select the Helm that you want to set the Autopilot trackpad for.
Select Helm:
1
NOTE: Please make sure engines are not running during configuration to avoid unexpected features being engaged from a key press.
Press 'Start': Lights on the configurable Autopilot trackpads will blink.
Start
P
H

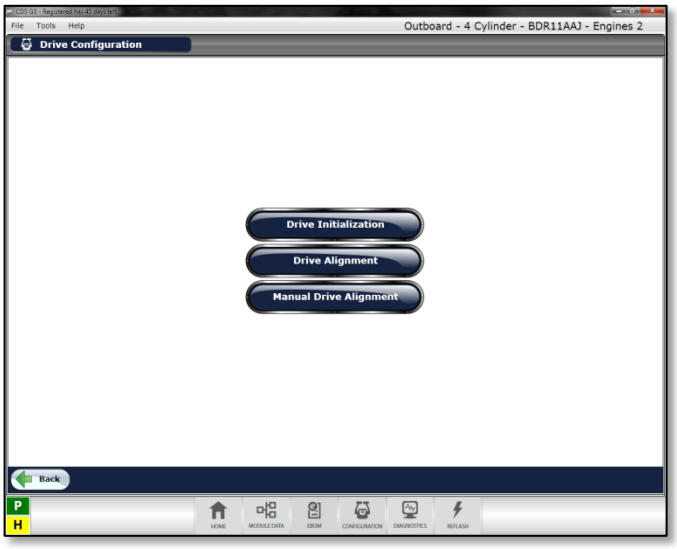
Assign Trackpad – This feature provides the user a wizard for assigning Autopilot Pad addresses by helm. All configurable Autopilot Pads on a helm will flash.
NOTE: Autopilot Pads on earlier Zeus and Axius models may not be configurable.

SMUX Configuration - SMUX Configuration allows the user to view and configure the SMUX on each helm. SMUX may also be known as rocker switches.

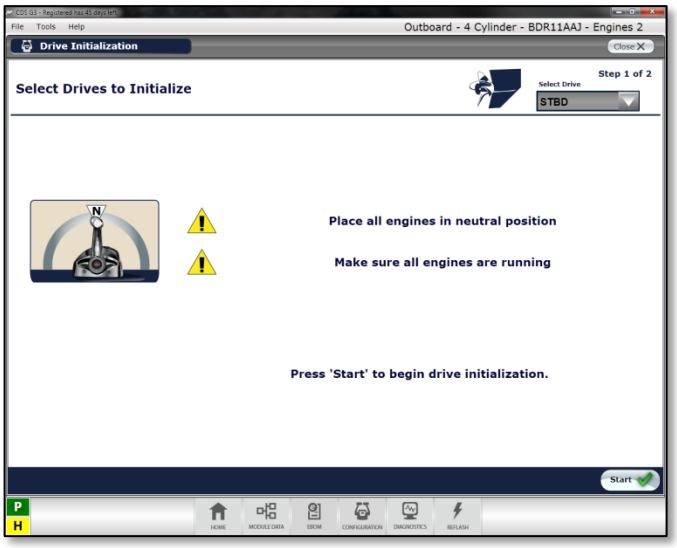
The Configuration tab displays the current SMUX Configuration status of all helms, as well as information related to each SMUX. SMUX that show in the grid with a black background are not configurable. If there is more than one SMUX at a single address, the SMUX in conflict will need to be reassigned to a new address. To identify a SMUX at a specific location with one in the grid, press a button on that SMUX and a cell in the grid will flash indicating its location.

The Assign SMUX tab provides the user a wizard for assigning SMUX addresses by helm. All configurable SMUX on a helm will flash.

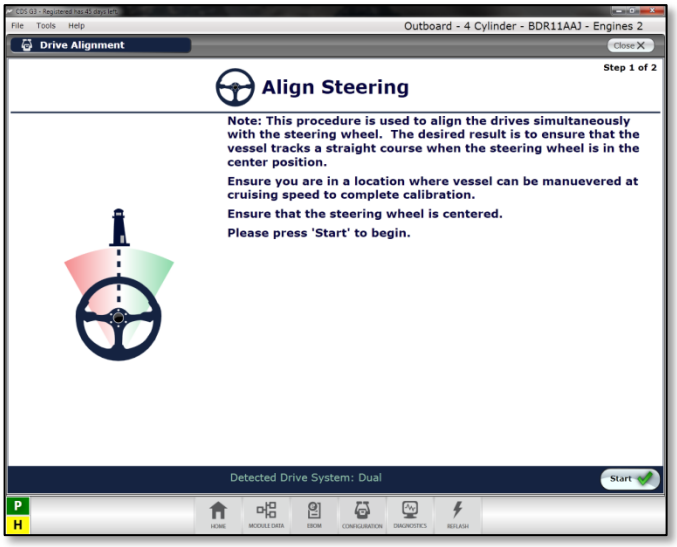
Drive Configuration - Drive Configuration provides access to a tool required for the setup or repair of a DTS system. The items within this section are as follows:



Drive Initialization - Drive Initialization provides access to a system feature that moves the drives and trim tabs throughout their range of operation to learn the sensor range values.


Outboard - 4 Cylinder - BDR11AAJ - Engines 2
Drive Initialization
Step 1 of 2
Select Drives to Initialize
Select Drive
STBD
Place all engines in neutral position
Make sure all engines are running
Press 'Start' to begin drive initialization.
Start

Drive Alignment - Drive Alignment provides access to a feature that performs an on the water and under power drive adjustments test needed to maintain a straight heading.

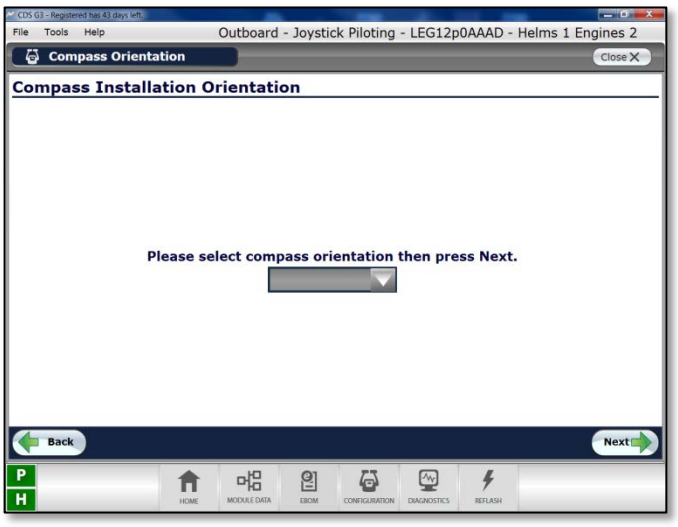

Outboard - 4 Cylinder - BDR11AAJ - Engines 2
Drive Alignment
Step 1 of 2
Align Steering
Note: This procedure is used to align the drives simultaneously with the steering wheel. The desired result is to ensure that the vessel tracks a straight course when the steering wheel is in the center position.
Ensure you are in a location where vessel can be manuevered at cruising speed to complete calibration.
Ensure that the steering wheel is centered.
Please press 'Start' to begin.
Detected Drive System: Dual
Start

Manual Drive Alignment - Manual Drive Alignment provides access to a feature that electronically unlocks the pod drives to allow them to be hand adjusted while out of the water.

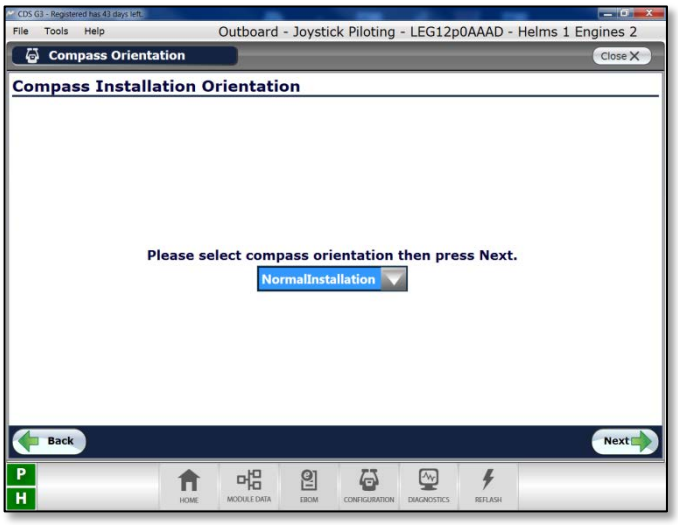
Manual Drive Alignment can now be performed for Zeus, Axius, and Joystick Piloting Outboard.

Compass Configuration - Compass Configuration provides access to any compass configuration settings required to setup or repair a Joystick Piloting vessel. The features within this section are as follows:

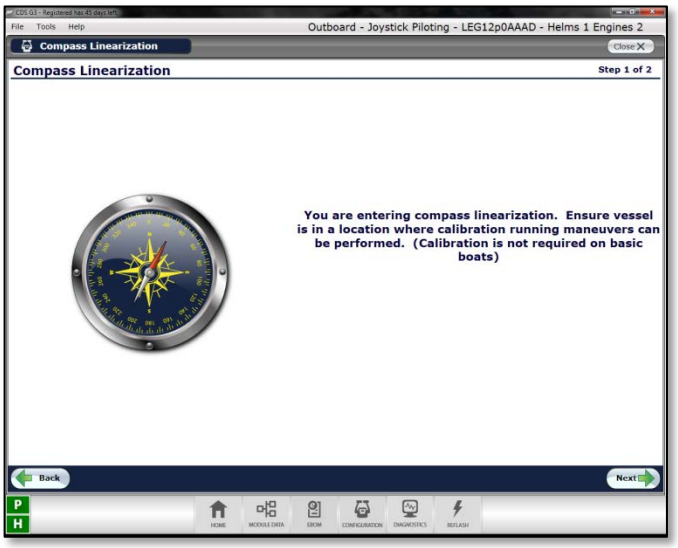
Compass Calibration Wizard - The Compass Calibration Wizard will walk you through all the steps necessary to configure and validate the compass for use by the autopilot systems. This is the recommended path for completing the compass configuration process.



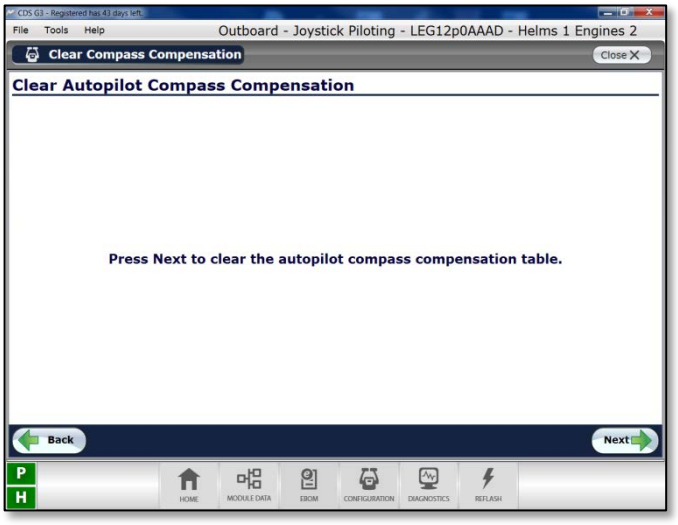
Compass Orientation - The Compass Orientation step allows you to define how the IMU is physically mounted with respect to the bow of the vessel.



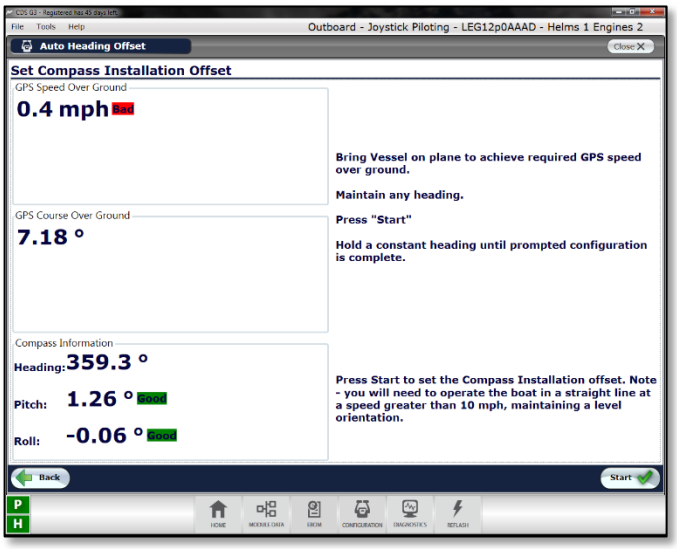
Compass Linearization - The Compass Linearization step will adjust the compass for your region's magnetic deviation.


File Tools Help
Outboard - Joystick Piloting - LEG12p0AAAD - Helms 1 Engines 2
Compass Linearization
Close
Compass Linearization
Step 1 of 2
You are entering compass linearization. Ensure vessel is in a location where calibration running maneuvers can be performed. (Calibration is not required on basic boats)
Back
Next
P
H

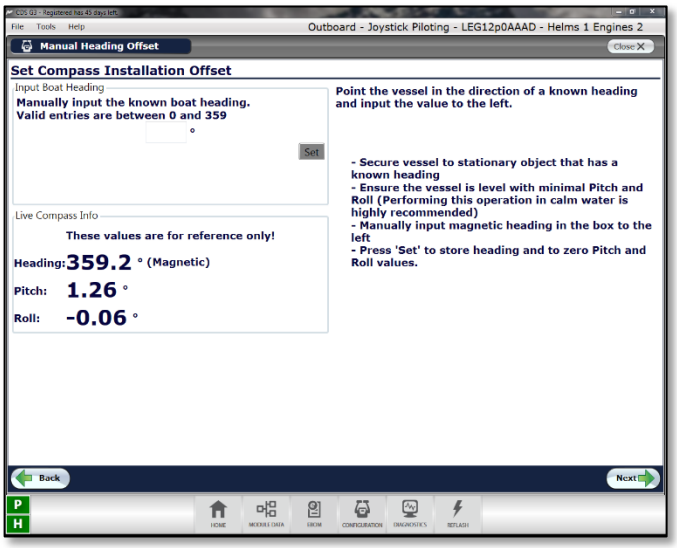
Clear Compass Compensation - The Clear Compass Compensation step clears the heading error Compensation table that is created and used by the autopilot to arbitrate headings between the IMU and GPS.



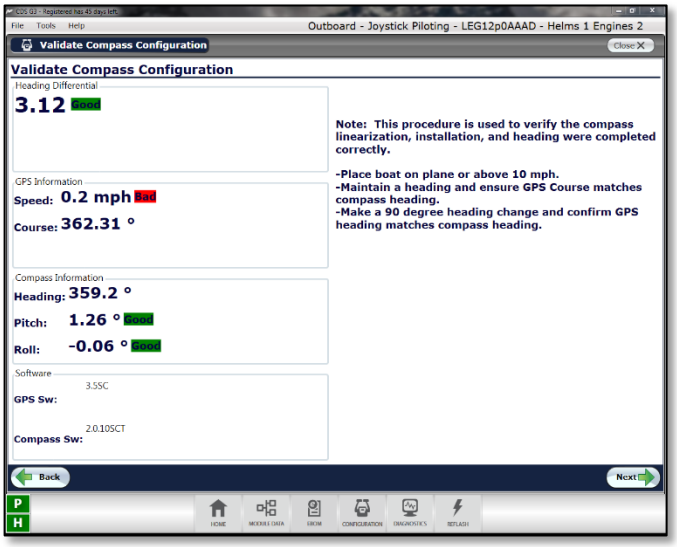
Auto Heading Offset - Auto Heading Offset uses the GPS to automatically adjust the compass based on how well the compass is pointed towards the bow of the boat.


Outboard - Joystick Piloting - LEG12p0AAAD - Helms 1 Engines 2
Auto Heading Offset
Set Compass Installation Offset
GPS Speed Over Ground
0.4 mph Bad
GPS Course Over Ground
7.18 °
Compass Information
Heading: 359.3 °
Pitch: 1.26 ° Good
Roll: -0.06 ° Good
Bring Vessel on plane to achieve required GPS speed over ground.
Maintain any heading.
Press "Start"
Hold a constant heading until prompted configuration is complete.
Press Start to set the Compass Installation offset. Note - you will need to operate the boat in a straight line at a speed greater than 10 mph, maintaining a level orientation.
Back
Start

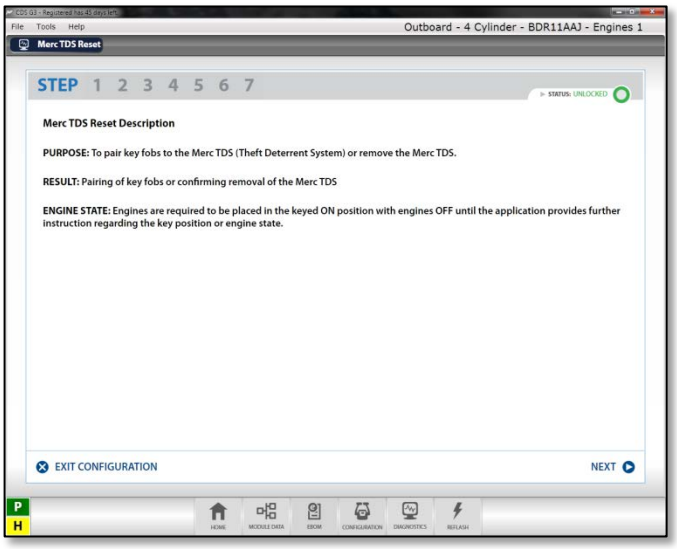
Manual Heading Offset – This feature allows you to manually enter a known heading by referencing another source (external to the boat) which will adjust for how accurate the compass is pointed towards the bow of the boat.


Outboard - Joystick Piloting - LEG12p0AAAD - Helms 1 Engines 2
Manual Heading Offset
Set Compass Installation Offset
Input Boat Heading
Manually input the known boat heading.
Valid entries are between 0 and 359
Set
Live Compass Info
These values are for reference only!
Heading: 359.2 ° (Magnetic)
Pitch: 1.26 °
Roll: -0.06 °
Point the vessel in the direction of a known heading and input the value to the left.
- Secure vessel to stationary object that has a known heading
- Ensure the vessel is level with minimal Pitch and Roll (Performing this operation in calm water is highly recommended)
- Manually input magnetic heading in the box to the left
- Press 'Set' to store heading and to zero Pitch and Roll values.
Back
Next

Validate Compass Configuration -The Validate Compass Configuration step validates your current compass to ensure it will work properly with the autopilot features.

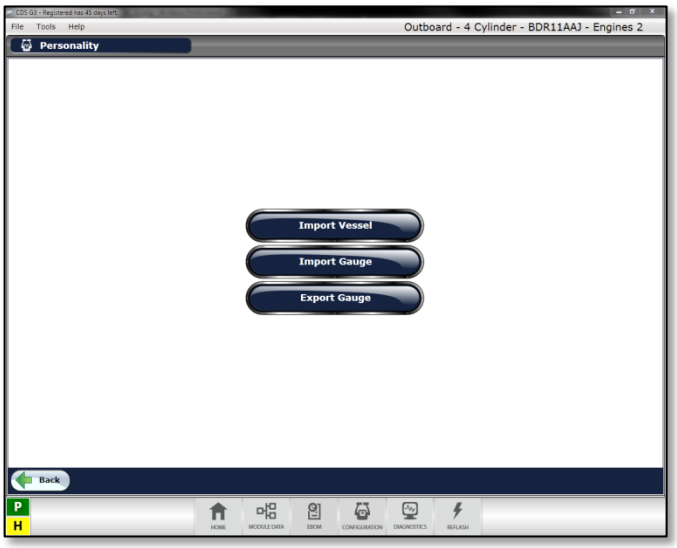

Outboard - Joystick Piloting - LEG12p0AAAD - Helms 1 Engines 2
Validate Compass Configuration
Validate Compass Configuration
Heading Differential
3.12 Good
GPS Information
Speed: 0.2 mph Bad
Course: 362.31 °
Compass Information
Heading: 359.2 °
Pitch: 1.26 ° Good
Roll: -0.06 ° Good
Software
3.5SC
GPS Sw:
2.0.10SCT
Compass Sw:
Note: This procedure is used to verify the compass linearization, installation, and heading were completed correctly.
-Place boat on plane or above 10 mph.
-Maintain a heading and ensure GPS Course matches compass heading.
-Make a 90 degree heading change and confirm GPS heading matches compass heading.
Back
Next

Merc TDS Reset **–** The TDS Reset configuration is used to pair key fobs to the Merc TDS (Theft Deterrent System) or remove the Merc TDS.


Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Merc TDS Reset
STEP 1 2 3 4 5 6 7
STATUS: UNLOCKED
Merc TDS Reset Description
PURPOSE: To pair key fobs to the Merc TDS (Theft Deterrent System) or remove the Merc TDS.
RESULT: Pairing of key fobs or confirming removal of the Merc TDS
ENGINE STATE: Engines are required to be placed in the keyed ON position with engines OFF until the application provides further instruction regarding the key position or engine state.
EXIT CONFIGURATION
NEXT

Personality – (previously Import) Personality allows access to a function for importing a vessel specific file into a boat that contains calibrated parameters. (Example: boat length, center of gravity, or reverse drive efficiency). These files are created by an OEM engineer. This feature applies to a Joystick Piloting system.

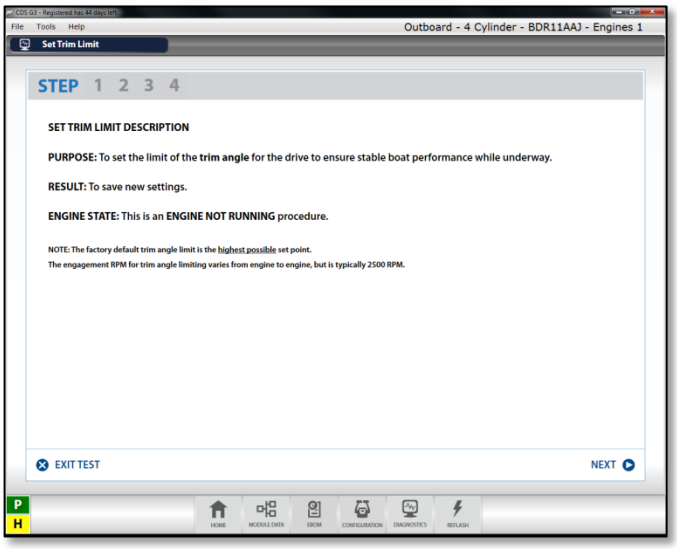
New in version 1.5: this screen also provides the ability to import and export gauge settings.



Diagnostics - Diagnostics allows access to "Diagnostic Functions" that enables the user to perform operations like injector test, spark test, setting engine location, cylinder misfire test, etc. These tests are initiated by CDS G3, but are controlled by the ECM/PCM.

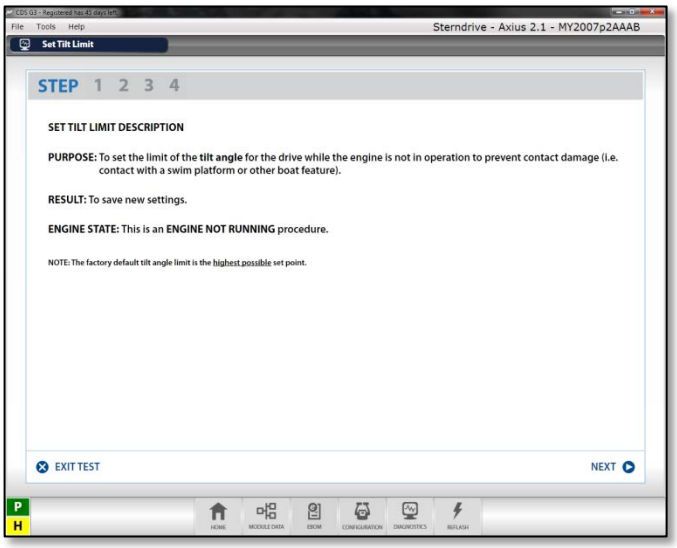
Set Trim Limit – This feature allows adjustment of the upper limit the drive can travel while under power.

Because this is a configuration feature, and not a test, this procedure will eventually be moved to Configuration.


Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Set Trim Limit
STEP 1 2 3 4
SET TRIM LIMIT DESCRIPTION
PURPOSE: To set the limit of the trim angle for the drive to ensure stable boat performance while underway.
RESULT: To save new settings.
ENGINE STATE: This is an ENGINE NOT RUNNING procedure.
NOTE: The factory default trim angle limit is the highest possible set point.
The engagement RPM for trim angle limiting varies from engine to engine, but is typically 2500 RPM.
EXIT TEST
NEXT

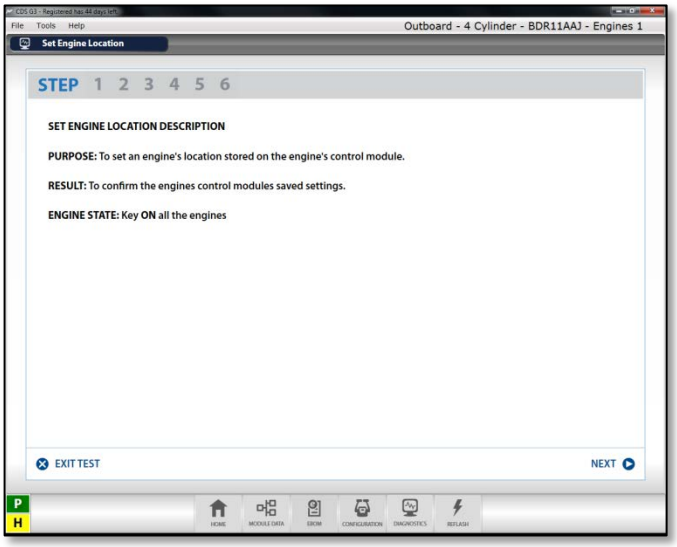
Set Tilt Limit – This feature allows the user to set the maximum tilt up location from an ERC. Tilt Limit is controlled through the ECM and is only active at low RPM and when the engine or drive receives a trim request from the ERC. Setting a lower value than factory default is useful if there is an obstruction that would cause damage to an engine, drive or boat component while trimming.

Because this is a configuration feature, and not a test, this procedure will eventually be moved to Configuration.


Sterndrive - Axius 2.1 - MY2007p2AAAB
Set Tilt Limit
STEP 1 2 3 4
SET TILT LIMIT DESCRIPTION
PURPOSE: To set the limit of the tilt angle for the drive while the engine is not in operation to prevent contact damage (i.e. contact with a swim platform or other boat feature).
RESULT: To save new settings.
ENGINE STATE: This is an ENGINE NOT RUNNING procedure.
NOTE: The factory default tilt angle limit is the highest possible set point.
EXIT TEST
NEXT

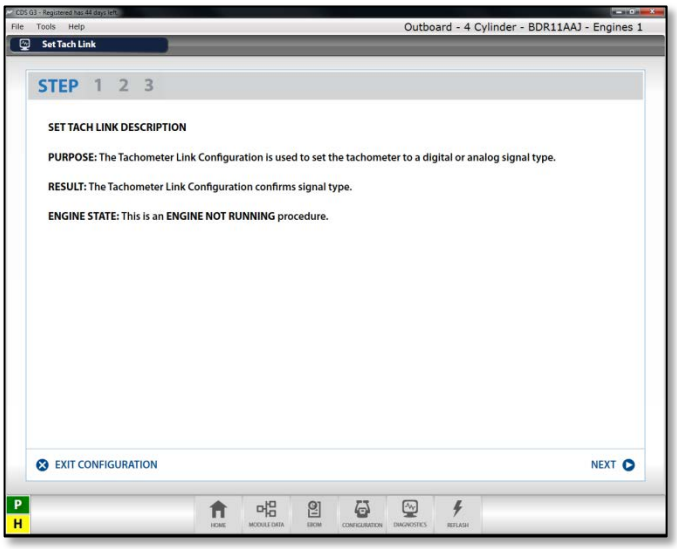
Set Engine Location – This feature allows the user to view or change the current engine location. Changing the engine location is necessary when setting up a multi-engine boat.

Because this is a configuration feature, and not a test, this procedure will eventually be moved to Configuration.


Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Set Engine Location
STEP 1 2 3 4 5 6
SET ENGINE LOCATION DESCRIPTION
PURPOSE: To set an engine's location stored on the engine's control module.
RESULT: To confirm the engines control modules saved settings.
ENGINE STATE: Key ON all the engines
EXIT TEST
NEXT

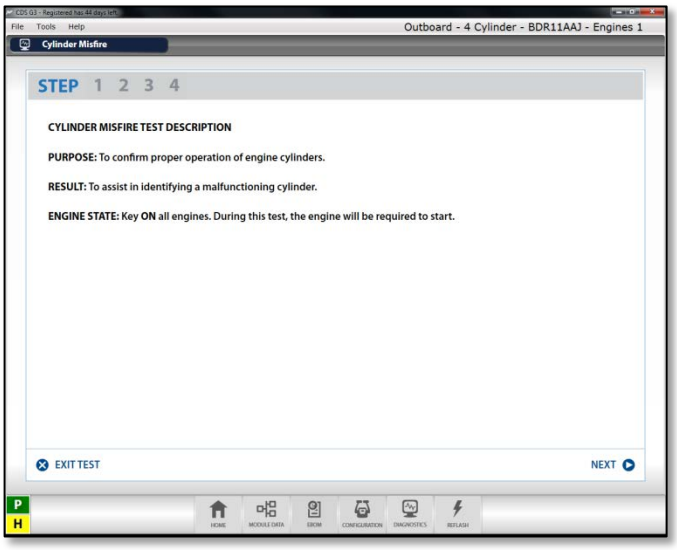
Set Tach Link – This feature allows the user to configure the signal coming from the gray engine harness tachometer lead. This drives either an Analog Gauge Interface (AGI) or an SC100 System Link gauge. When Tach Link is enabled the gray tachometer lead does not output the analog tach signal. Instead, the PCM sends a digital signal that can be received by the Analog Gauge Interface (AGI) or SC100 System Link gauges (if the proper adapter harnesses are connected). To turn the Tach Link function OFF, select Disable. The gray engine harness tach lead once again outputs an analog tach signal. Tach Link only appears as an Active Test menu option if the function is supported by the selected engine's processor.

Because this is a configuration feature, and not a test, this procedure will eventually be moved to Configuration.

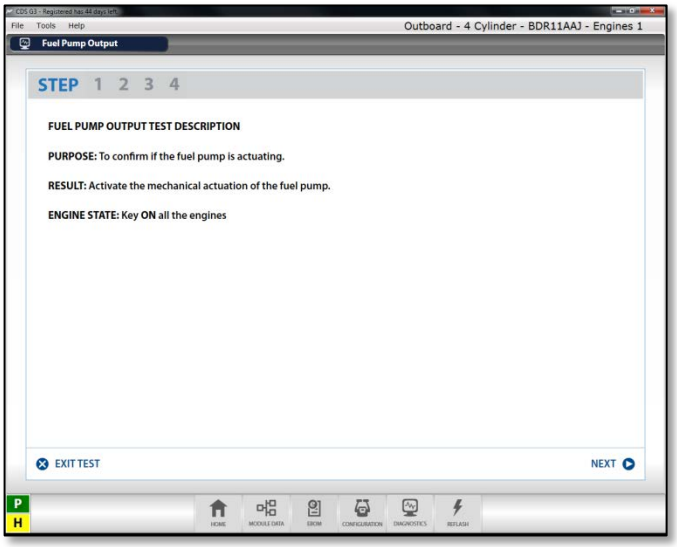

File Tools Help
Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Set Tach Link
STEP 1 2 3
SET TACH LINK DESCRIPTION
PURPOSE: The Tachometer Link Configuration is used to set the tachometer to a digital or analog signal type.
RESULT: The Tachometer Link Configuration confirms signal type.
ENGINE STATE: This is an ENGINE NOT RUNNING procedure.
EXIT CONFIGURATION
NEXT
P
H

Cylinder Misfire – This test allows the user to isolate a problem for a particular cylinder. Select a cylinder and start the test to diagnose the engine; watch and listen for a reaction in the running of the engine to occur. No reaction would indicate a possible issue on that cylinder.

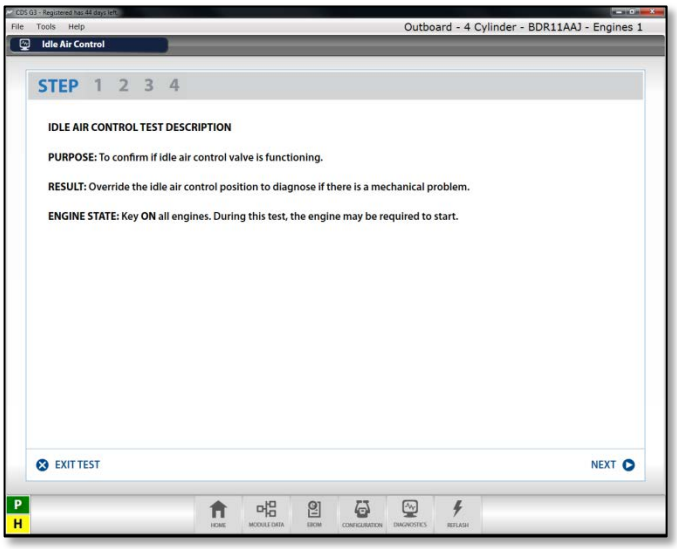
NOTE: On FourStroke large horsepower engines it may be difficult to detect any noticeable RPM or sound changes when the misfire test is done at idle. If no obvious change is noticed, try to test again at another throttle position greater than zero percent or under load.


File Tools Help
Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Cylinder Misfire
STEP 1 2 3 4
CYLINDER MISFIRE TEST DESCRIPTION
PURPOSE: To confirm proper operation of engine cylinders.
RESULT: To assist in identifying a malfunctioning cylinder.
ENGINE STATE: Key ON all engines. During this test, the engine will be required to start.
EXIT TEST
NEXT
P
H

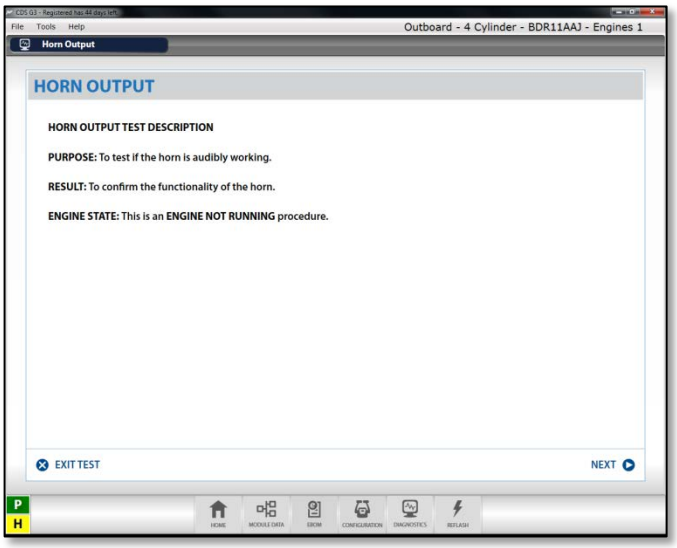
Fuel Pump Output – This test allows user to test the fuel pump for mechanical activity. The test will not function if the engine is running.


File Tools Help
Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Fuel Pump Output
STEP 1 2 3 4
FUEL PUMP OUTPUT TEST DESCRIPTION
PURPOSE: To confirm if the fuel pump is actuating.
RESULT: Activate the mechanical actuation of the fuel pump.
ENGINE STATE: Key ON all the engines
EXIT TEST
NEXT
P
H

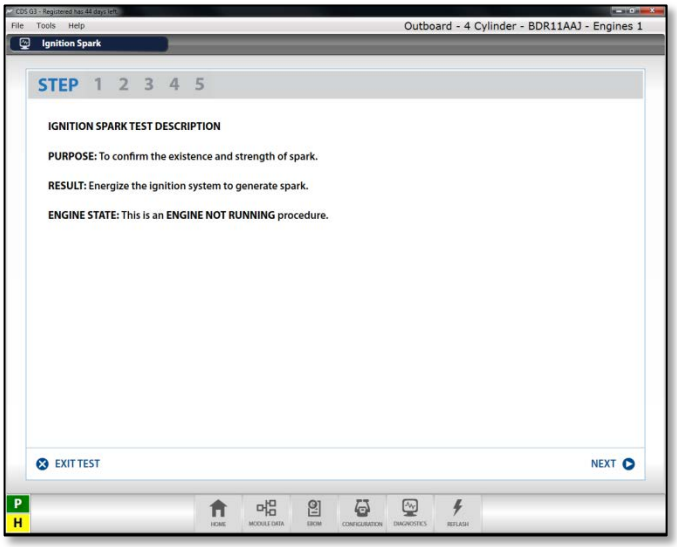
Idle Air Control – This feature allows the user to test the functionality of the Idle Air Control valve. The behavior of this test on a running engine will depend on the engine coolant temperature and idle control calibration in the ECM. Once the engine has reached its normal operating temperature the running test will allow you to apply a positive or negative offset to the base IAC set point. As you decrease the offset with a negative value the engine RPM should decrease. The engine idle control strategies may prevent you from exceeding allowable set points.


File Tools Help
Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Idle Air Control
STEP 1 2 3 4
IDLE AIR CONTROL TEST DESCRIPTION
PURPOSE: To confirm if idle air control valve is functioning.
RESULT: Override the idle air control position to diagnose if there is a mechanical problem.
ENGINE STATE: Key ON all engines. During this test, the engine may be required to start.
EXIT TEST
NEXT
P
H

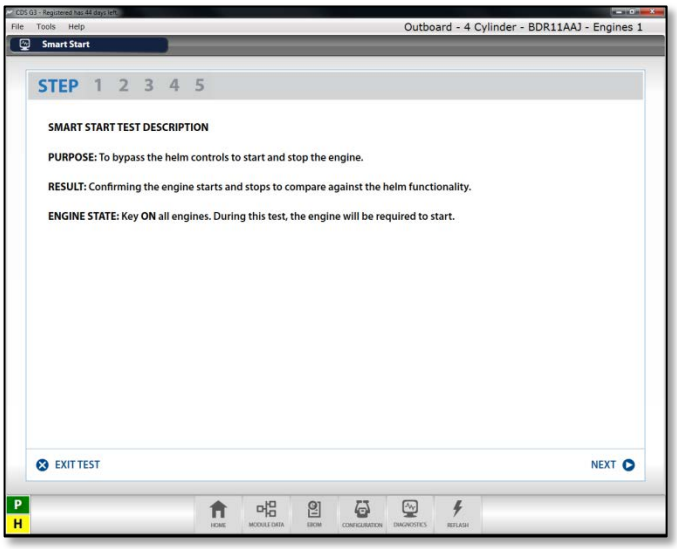
Horn Output – This feature allows the user to test the horn. Listen for the horn to sound during this test.


File Tools Help
Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Horn Output
HORN OUTPUT
HORN OUTPUT TEST DESCRIPTION
PURPOSE: To test if the horn is audibly working.
RESULT: To confirm the functionality of the horn.
ENGINE STATE: This is an ENGINE NOT RUNNING procedure.
EXIT TEST
NEXT
P
H

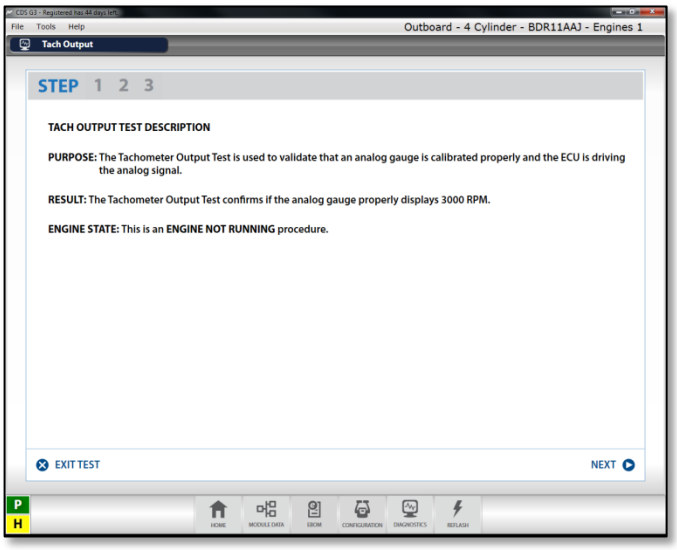
Ignition Spark – This test confirms the existence and strength of spark.


File Tools Help
Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Ignition Spark
STEP 1 2 3 4 5
IGNITION SPARK TEST DESCRIPTION
PURPOSE: To confirm the existence and strength of spark.
RESULT: Energize the ignition system to generate spark.
ENGINE STATE: This is an ENGINE NOT RUNNING procedure.
EXIT TEST
NEXT
P
H

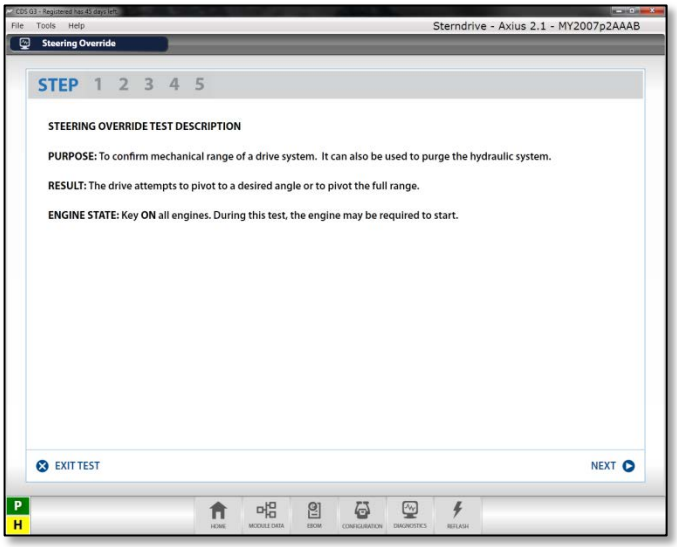
Smart Start – This feature allows the test of the Smart Start system and allows the user to start and stop of the engine from the CDS G3 program.


File Tools Help
Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Smart Start
STEP 1 2 3 4 5
SMART START TEST DESCRIPTION
PURPOSE: To bypass the helm controls to start and stop the engine.
RESULT: Confirming the engine starts and stops to compare against the helm functionality.
ENGINE STATE: Key ON all engines. During this test, the engine will be required to start.
EXIT TEST
NEXT
P
H

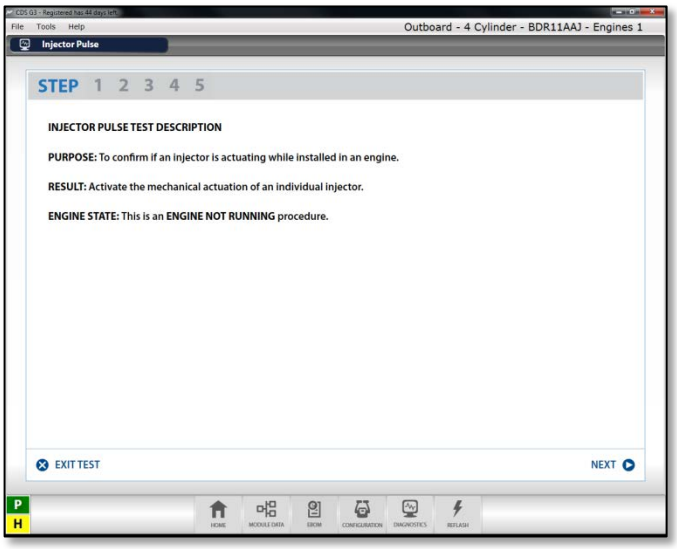
Tach Output – Used to validate that an analog gauge is calibrated properly and the ECU is driving the analog signal.


File Tools Help
Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Tach Output
STEP 1 2 3
TACH OUTPUT TEST DESCRIPTION
PURPOSE: The Tachometer Output Test is used to validate that an analog gauge is calibrated properly and the ECU is driving the analog signal.
RESULT: The Tachometer Output Test confirms if the analog gauge properly displays 3000 RPM.
ENGINE STATE: This is an ENGINE NOT RUNNING procedure.
EXIT TEST
NEXT
P
H

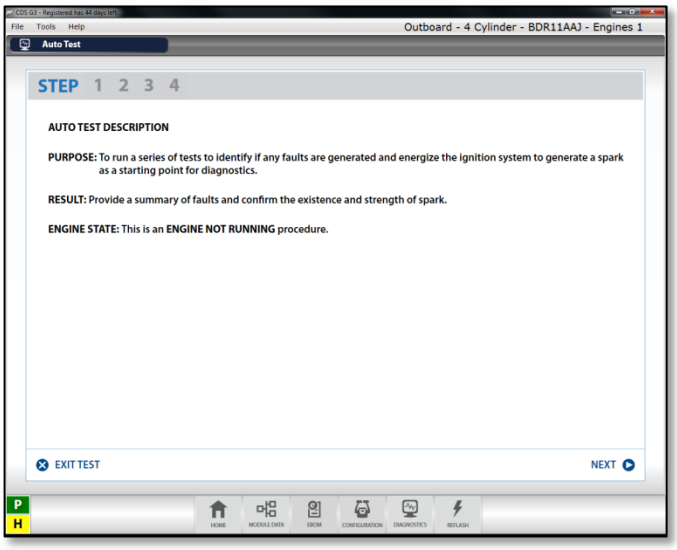
Steering Override – This test is used on Axius engines only and allows the user to override the TVM drive position on an Axius Gen 1 or Axius Gen 2 system. The user can set the drive position via a slider or select auto to begin a sine wave sequence for a short period of time. For Axius Gen 1, the engine must be running to change the drive position. Axius Gen 2 systems have the option to override the drive position while the engine is not running.


File Tools Help
Sterndrive - Axius 2.1 - MY2007p2AAAB
Steering Override
STEP 1 2 3 4 5
STEERING OVERRIDE TEST DESCRIPTION
PURPOSE: To confirm mechanical range of a drive system. It can also be used to purge the hydraulic system.
RESULT: The drive attempts to pivot to a desired angle or to pivot the full range.
ENGINE STATE: Key ON all engines. During this test, the engine may be required to start.
EXIT TEST
NEXT
P
H

Injector Pulse – This test confirms if an injector is actuating while installed in the engine.


Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Injector Pulse
STEP 1 2 3 4 5
INJECTOR PULSE TEST DESCRIPTION
PURPOSE: To confirm if an injector is actuating while installed in an engine.
RESULT: Activate the mechanical actuation of an individual injector.
ENGINE STATE: This is an ENGINE NOT RUNNING procedure.
EXIT TEST
NEXT

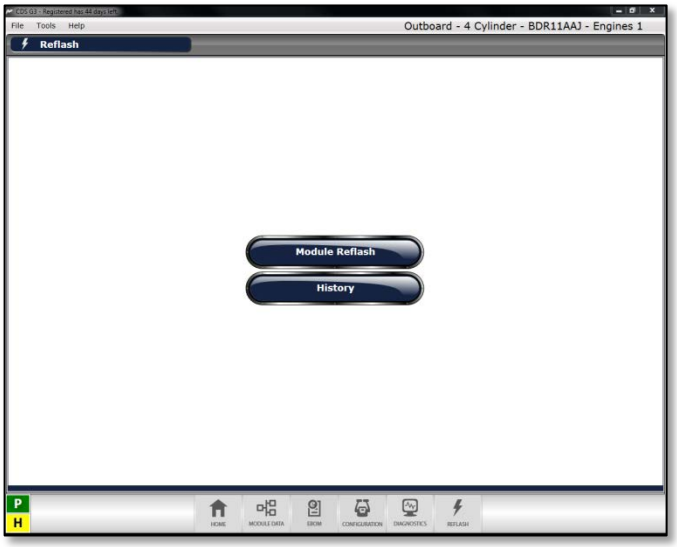
Auto Test – this test performs a series of tests to identify if any faults are generated. This test also energizes the ignition system to generate a spark as a starting point for diagnostics.


Outboard - 4 Cylinder - BDR11AAJ - Engines 1
Auto Test
STEP 1 2 3 4
AUTO TEST DESCRIPTION
PURPOSE: To run a series of tests to identify if any faults are generated and energize the ignition system to generate a spark as a starting point for diagnostics.
RESULT: Provide a summary of faults and confirm the existence and strength of spark.
ENGINE STATE: This is an ENGINE NOT RUNNING procedure.
EXIT TEST
NEXT

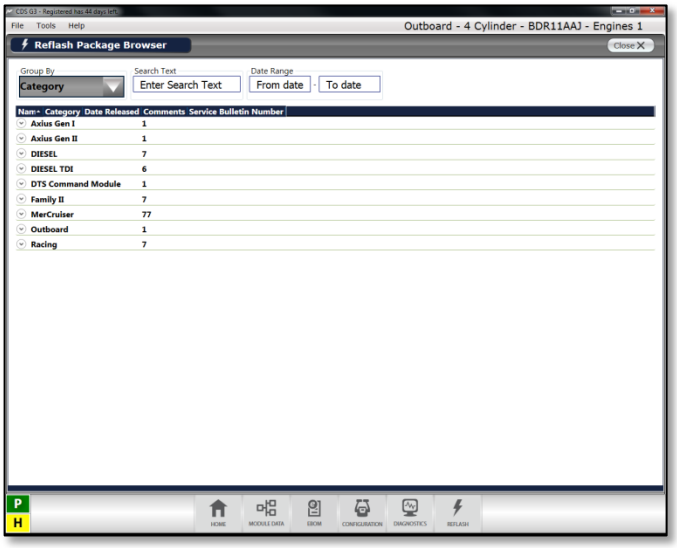
Reflash

Reflash allows a user to reprogram control modules.

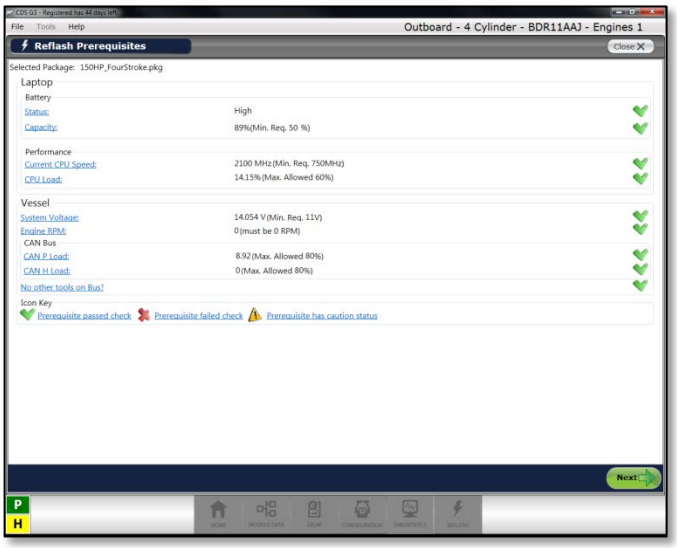
- Module Reflash – This feature will take you into a guided process for reprogramming modules.
- History – This will allow the user to view all previously performed reflash events.



Reflash Package Browser – The browser displays a list of available reflash upgrades. The page file consists of specific modules that are allowed to be upgraded. The page also gives the user a wide variety of methods to sort and search the list of package files (e.g. date, category, service bulletin, etc.)

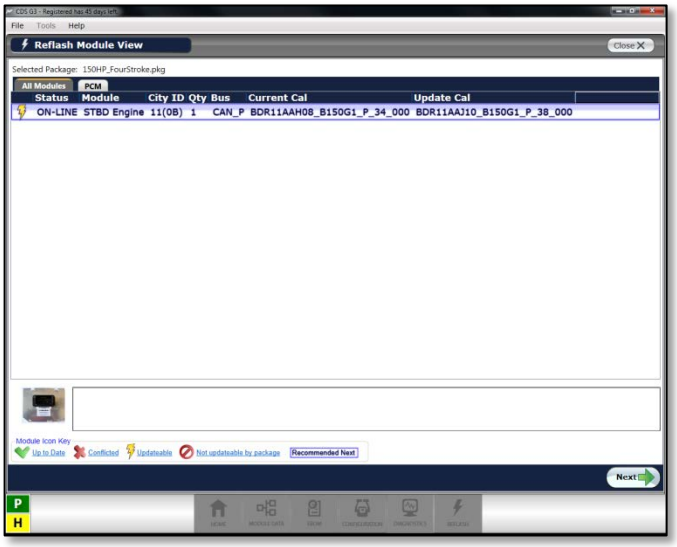


Reflash Prerequisites – These indicates the requirements that must be met for reflash to proceed. If you receive green check marks the requirements have been met. A red X indicates the prerequisite has not been met. A yellow exclamation point identifies a caution status. For details on each prerequisite, see the dedicated page under reflash in the help menu.

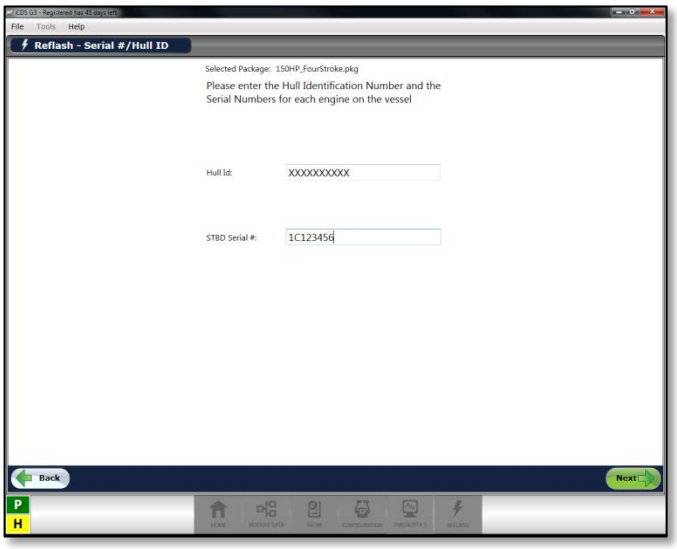


Reflash Module View - This view will show you the modules available from the selected reflash package. If the module is upgradeable this will be indicated by a lightning bolt icon. The topmost upgradeable module will be highlighted indicating the order in which to reflash. Up-to-date modules will be indicated by a green check icon. Modules that are in the package but that may have a wrong Cal ID, or missing information, will be indicated by a slashed circle icon. Modules that are conflicted (i.e.: more than one module on the same City ID) will be indicated by a red icon.

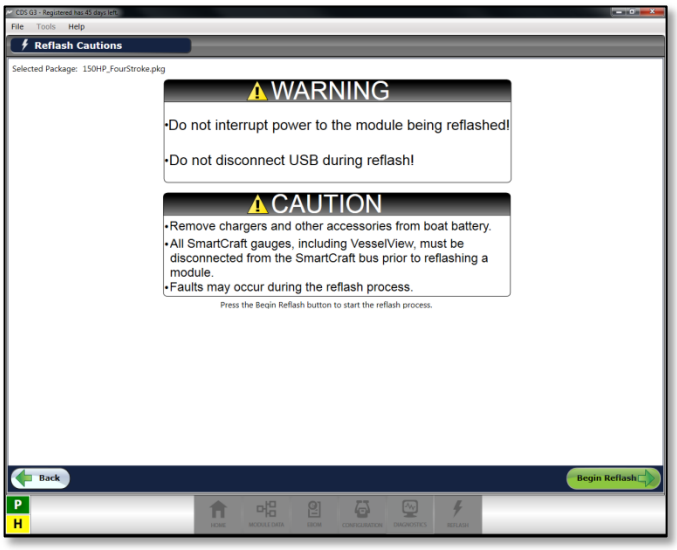
NOTE: Multiple engine/helm configurations may require a certain engine to be keyed off.



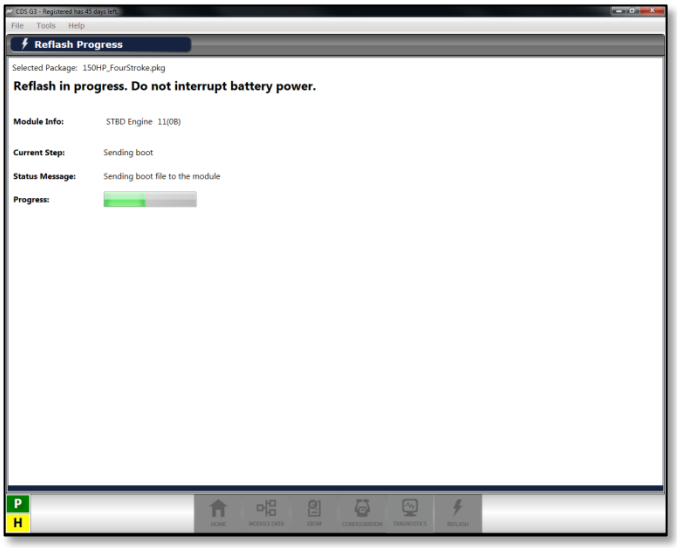
Reflash - Serial Number/Hull ID – This allows the user to input the information into CDS G3 for record keeping.



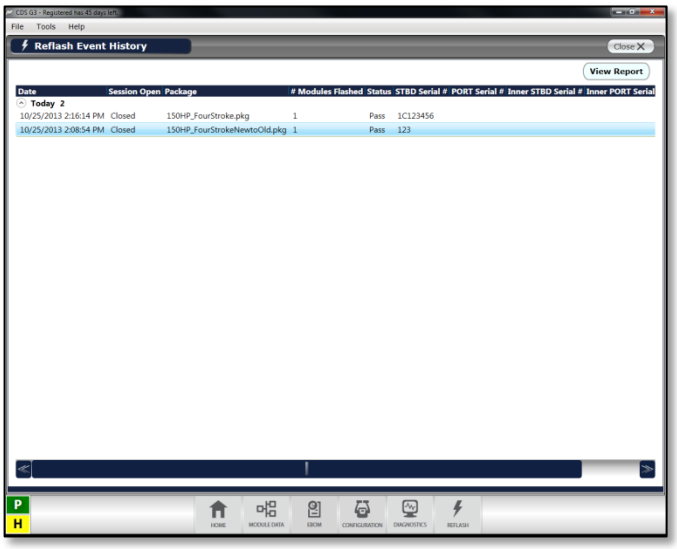
Reflash Cautions – This page warns the user to be careful when reflashing. It is important to make sure you disconnect all SmartCraft gauges, including VesselView, prior to reflash.


File Tools Help
Reflash Cautions
Selected Package: 150HP_FourStroke.pkg
WARNING
•Do not interrupt power to the module being reflashed!
•Do not disconnect USB during reflash!
CAUTION
•Remove chargers and other accessories from boat battery.
•All SmartCraft gauges, including VesselView, must be disconnected from the SmartCraft bus prior to reflashing a module.
•Faults may occur during the reflash process.
Press the Begin Reflash button to start the reflash process.
Back
Begin Reflash
P
H

Reflash Progress – This page allows the user to monitor the progress of the reflash event. After a successful reflash, helm adaption or set engine location may be required as determined by the package file. Perform the required steps and click close to be redirected to finalize the reflash session.



Reflash Event History – This feature informs the user of the status of a reflash session. A session that is open may be continued right from the reflash event page. To continue a reflash session, highlight an entry that indicates an open session and click Resume Reflash. You will then be redirected to the Reflash Prerequisites screen.



Show Options

These settings are accessed from the upper text menu by choosing “Options”

Show Options allows you to setup or change certain behaviors of the software. For instance, the user could change the save location of the Print Screen function indicated.

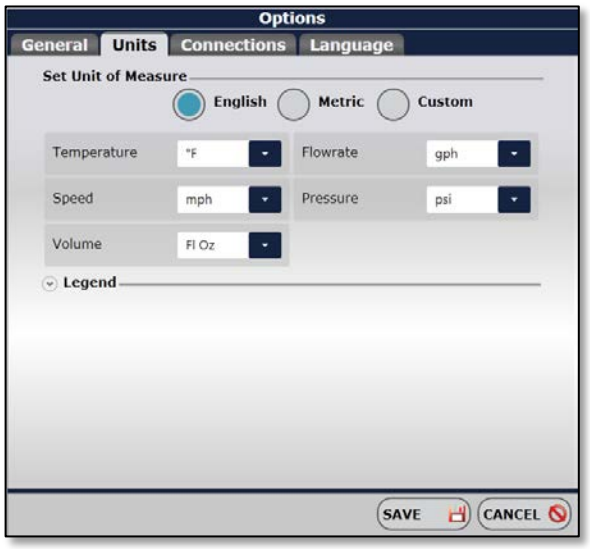
CAN Hardware Settings – This menu allows the user to configure the SmartCraft Diagnostic Interface

Reflash History Directory – This menu allows the user to view and change the reflash history output directory where reflash reports will be saved.

Data Record – The Data Record settings allow the user to change the location the application will place a recorded file and the CSV export file.

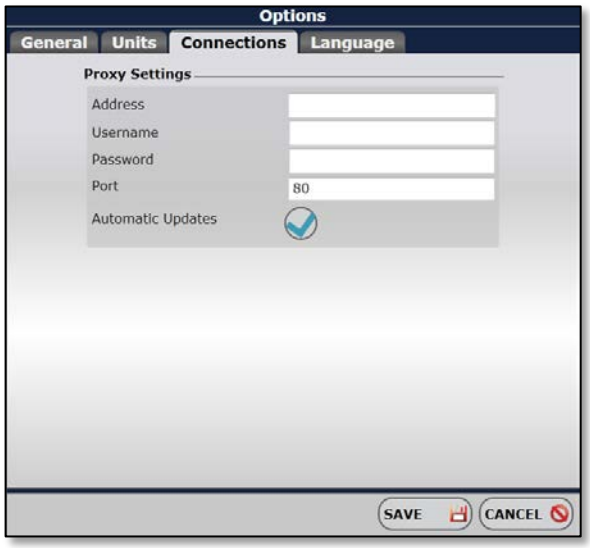
Screenshots – This menu allows the user to configure the print screen settings by changing its location.

Units - This function was released with version 1.4 software. It allows the user to change the Units of Measure on the live data screen. You can choose from English, Metric, or Custom which allows you to customize your Units of Measure for each of the following: Temperature, Speed, Volume, Flow Rate and Pressure.

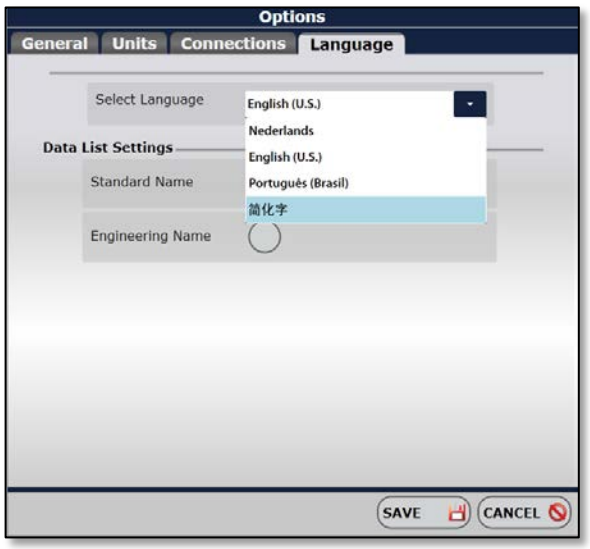


Connections – This menu allows the user to enter proxy settings that may be required in order to access the internet in a managed network.

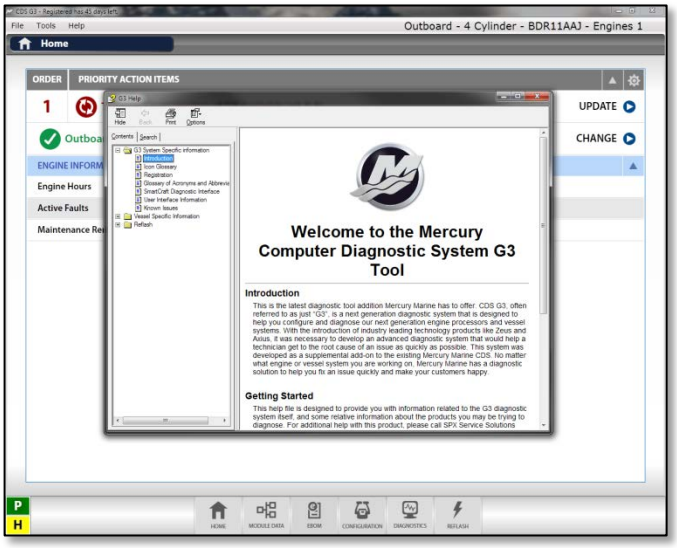
NOTE: For most dealerships proxy settings will not be used. Only enter information your network administrator provides. Entering incorrect information will prevent registration and updates from functioning.



Language - This screen allows the selection of foreign languages. It also allows you to set the Data List descriptions from standard to engineering terms.



Help Screen – The Help Screen is available by selecting Help → Contents from the upper text menu. Help allows access to additional information related to the G3 product as well as the system in which it communicates with.



Other Training Opportunities

Mercury University provides comprehensive E-Skills and Instructor-led training with CDS G3.

E-Skill Courses include:

- CDS G3 Software, Menus and Navigation
- CDS G3 Covering 40-60 HP EFI FourStroke
- MerCruiser Catalyst Troubleshooting

Instructor Led Training Courses include:

- Intro to CDS
- FourStroke
- FourStroke Advanced Troubleshooting
- Catalyst Advanced Troubleshooting

Sign up for courses at www.mercuryuniversity.com

FAQ's

I am entering my dealer number and phone number correctly to register but I receive an error stating "Invalid Dealer".

CDS G3 requires your full dealer number and phone number. Verify you are entering these correctly.

Is CDS G3 Windows 7 compatible?

Yes, since version 1.2. Compatibility is limited to Windows 7 Professional, Ultimate, or Enterprise. Windows has other versions, most commonly Windows 7 Home Premium which is not compatible with CDS G3. You may be able to update non-compatible versions of Windows 7. Refer to Microsoft Windows Anytime Upgrade for details.

http://windows.microsoft.com/en-US/windows/shop/windows-anytime-upgrade

Is CDS G3 Windows 8 Compatible?

CDS G3 version 1.5 is compatible with Windows 8 Professional,

Is CDS G3 compatible with 64 bit operating systems?

Yes, version 1.2 was compatible but contained a bug which prevented the software from updating. This issue was corrected in version 1.4. All versions from 1.4 forward are fully compatible with 64 bit operating systems.

Will CDS G3 work with Verado?

At this time, CDS G3 will work with Joystick Piloting for Outboards, including Verado. Older versions of Verado require CDS.

What should I put in the Proxy Settings in Options/Connections?

Do not put anything in these fields unless specified by your network administrator. In most cases, a proxy is not used. If these fields are filled in incorrectly, communication to our servers for registration and updates will fail.

Appendix

SmartCraft Interface Driver Installation

In versions prior to 1.4, we have noticed a high number of issues with the SmartCraft Interface cable not working after a new installation. In version 1.4, we have addressed several issues to improve this process. If you experience a suspected driver issue, the key indicator is the green power LED on the SmartCraft Interface cable is flashing. This likely means the driver is not associating with the hardware. Reference the following Manual Driver Installation instructions. If it is solid, try to reboot your PC and try again.

Manual Driver Installation

To begin, make sure your SmartCraft Interface is unplugged and CDS G3 is closed. Plug in the SmartCraft Interface and watch the lower right hand corner for a "new hardware found" notification. Click on this notification to open the "New Hardware Wizard". When asked if "Windows can connect to Windows Update…" select "No, not this time". The driver was already installed with CDS G3. On the next screen, select "Install the Software Automatically". When finished, confirm the green power LED on the SmartCraft Interface is no longer flashing. A reboot may be required.

It is recommended to repeat this process for each USB port on your PC.

Error Codes

Error Code 100
The application has encountered an authentication error and must close.
Please contact Mercury Service for further assistance.

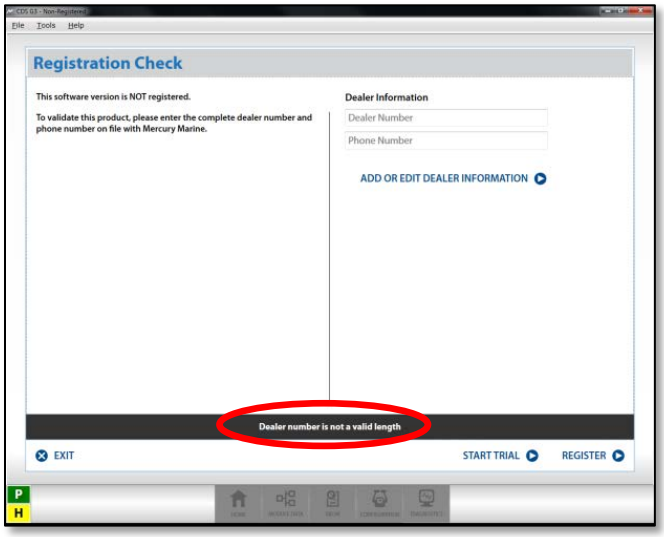
Error Code 100 occurs when something has changed on the PC that affects the registration file. This could include replacing a hard drive, or motherboard, or changing the name of the PC.

Error Code 101
The application has encountered a system clock validation error and must close.
Please contact Mercury Service for further assistance.

Error Code 101 occurs when the system clock has been altered from the correct time and date. Check your time and date for accuracy. If your time and date repeatedly changes to a previous point and does not keep its setting after a reboot, the battery (frequently referred to as a CMOS battery) on the motherboard may require replacement.

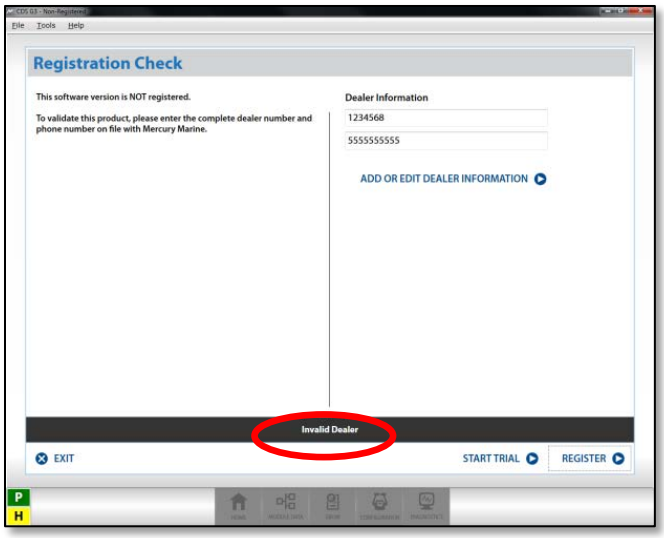
Registration Errors

The following is a list of possible licensing and registration errors, and what they mean.


Registration Check
This software version is NOT registered.
To validate this product, please enter the complete dealer number and phone number on file with Mercury Marine.
Dealer Information
Dealer Number
Phone Number
ADD OR EDIT DEALER INFORMATION
Dealer number is not a valid length
EXIT
START TRIAL
REGISTER

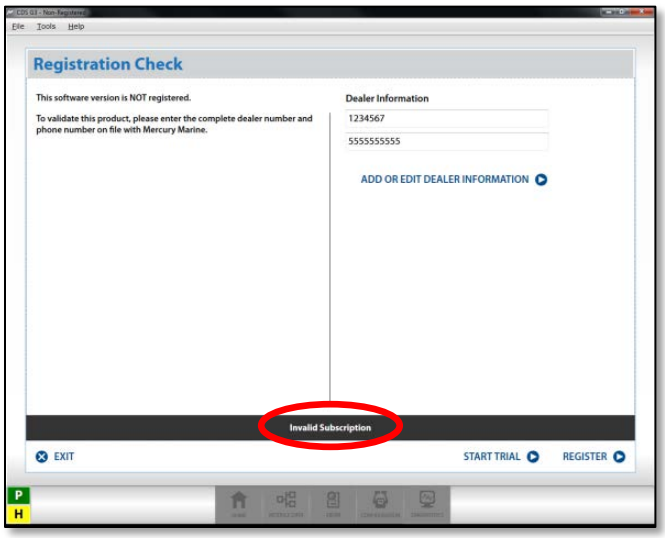
ERROR: Dealer Number is not a valid length

This error occurs when dealer number has 3 or less characters. Enter complete dealer number to correct. **U.S. and Canadian dealer numbers required will be 7 digits.** In other countries, dealer numbers may be alpha numeric and as few as 4 numbers.



ERROR: Invalid Dealer

This error occurs when the entered dealer number is not found in the CDS G3 Subscription database. Either the dealer has entered a wrong number or a subscription has never been issued to that dealer for any CDS G3 license.

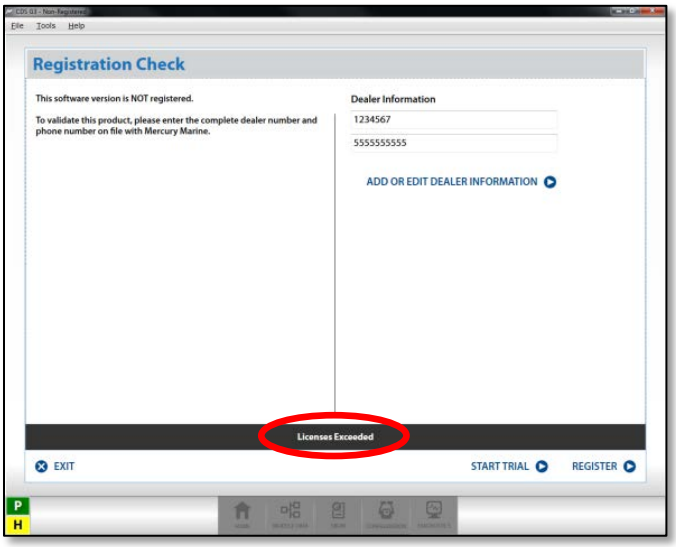


ERROR: Invalid Subscription

The dealer number is in the CDS G3 subscription database, but a subscription for that specific version is not found. This error will occur if the dealer has a license for a different version of CDS G3. A license purchase for your dealership may be required. For questions related to licensing and invalid subscriptions, please contact Mercury Technical Service.

ERROR: Licenses Exceeded

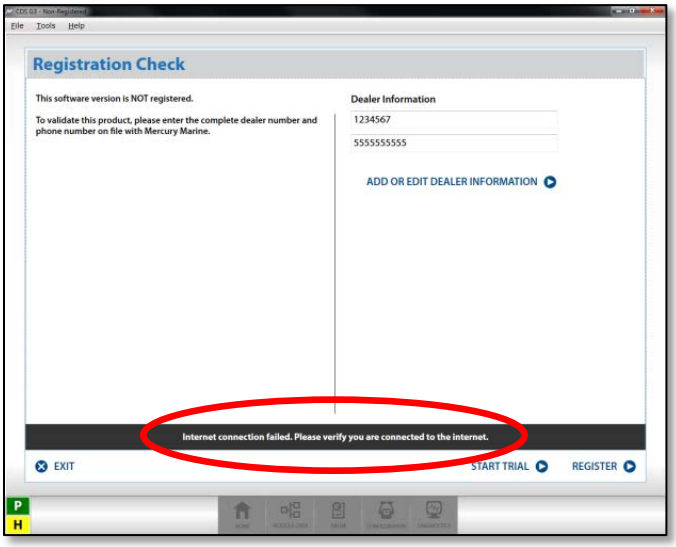
The dealer may have 1 or more licenses for the specific version of CDS G3, but they are already registered or in use. Releasing a license will allow re-registration on a different computer.



ERROR: Internet Connection Failed. Please verify you are connected to the internet

This error occurs when CDS G3 cannot connect to the MercNet Server. This issue could be caused by several issues:

- No internet connection available
  - Confirm using internet browser
- Communication is being blocked
  - Possibly firewall/router. Could be ISP.
- Incorrect Proxy entered
  - Most dealers will not require a proxy. No information should be entered unless required and provided by their IT Administrator. This can be reviewed by selecting Tools/Options/Connections.
- Security Certificate issue
  - Confirm the computer can connect to mercnet.mercurymarine.com. If not, the security certificate may need to be updated.
  - Usually computer is not updated. Perform all "high priority" updates through Windows Updates.



ERROR: Inactive Dealer

The dealer number entered is no longer active with Mercury Marine.